The PHOTOFACT Servicer

SEPTEMBER 20th, 1946 ★ *Published for all users of Howard W. Sams' PhotoFact Folders* ★ VOL. 1, No. 5

AUTUMN IS HERE

It's snappy crisp cool autumn weather here in Indianapolis as we go to press on PHOTOFACT Folder Set No. 5. We like cool weather . . . it brings a lot of radio listening . . . and that means that folks are going to have the repairs made they have been putting off all summer.

Indeed, it's nice to sit before the fire and listen to the radio, and maybe munch some popcorn . . . and it's time for radio service men to capitalize on the season. These are the months when you can make extra profits.

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SPECIAL FEATURE

Service Notes on Zenith 1946 Models!

Through the special courtesy of the Zenith Radio Corporation we are privileged to bring you a preliminary sheet covering the Factory Service Notes on the 1946 models of Zenith Receivers. Zenith wants their receivers properly serviced in the field. Zenith deserve your unstinted praise for this sort of cooperation which not only is unusual but marks a distinct trend toward closer cooperation between the Set Manufacturer and the Radio Service Engineer.

It marks another FIRST for PHOTOFACT Folders, designed to save your time and to speed your servicing.

Service notes of other manufacturers will be published in forthcoming editions—watch for them!

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NEW FOLDERS FOR SERVICEMEN

Announced in PHOTO FACT Folder Set No. 3, the monograph "How Much Is Your Labor Worth?" by our treasurer, Mr. Don Shaw has proven so popular that he has added a PART 2, which amplifies the thoughts of the original folder, and expands them for wider application.

If you wish a copy of "How Much Is Your Labor Worth? PART 2," just drop us a line and we will send it to you without charge. We still have copies of PART 1, so that if you forgot to ask for your copy, let us know at once. Many service engineers have expressed their desire for information on accounting procedures. We regard this as a healthy sign that they intend to make their business profitable—which is just what it should be. We'll try to do our part by providing special material for Institute Members, as rapidly as possible. Watch for the announcements.

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THE R.M.A. CODE

So many of you have asked for RMA Code Number identification, that we obtained permission from RMA to publish a sheet containing this information. It is enclosed with this folder and should become a very valuable addition to your source information file.

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REMINGTON-RAND BINDERS

Material shortages have plagued our vendor from the beginning, and it now appears that the delivery on the deluxe Remington-Rand Binders will not start until about October 10th; although we are still hoping that this date can be improved. If you wish to file your PHOTOFACT Folders in this manner, we suggest that you leave an open order with your radio parts supply house to ship yours as soon as his stock arrives.

Just as a reminder, the Remington-Rand Imitation Leather Hard Cover Three Post Binders are in the "super-duper" class. For those of you who wish to keep their Folders in a big impressive cover, these binders are an outstanding value at $3.39 each net from your distributor. Incidentally, if you have lost or mislayed your copy of "How to Use PHOTOFACT Folders, which includes a suggested service procedure, and detailed filing suggestions, just write us. We will be happy to supply you with a duplicate.

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WET STRENGTH PAPER

Have you heard about the new "Wet Strength" paper, which was described in the September, 1946, issue of Popular Science Monthly, and abstracted in the September, 1946, issue of Readers Digest? This new paper has tremendous strength, even when soaking wet. It has been highly successful for military use—the Army used over 4 million "Wet Stength" maps during the war.

We have been successful in procuring two carloads of this new "Wet Strength" paper, and it will be used to make the envelopes or containers for PHOTOFACT Folders. Here is another step in our policy towards constant improvement, and for making the PHOTOFACT Folders better than ever.

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PHOTOFACT FOLDER NUMBERS

Many subscribers have asked why we could not number our Folders in alphabetical order, as a convenience in filing. We would like to comply but this is impossible. The numbers automatically "assign themselves" in the order that the sample chasses are received. To help you we started placing the Folders in the Envelopes in alphabetical order, beginning with PHOTOFACT Folder Set No. 3.

Your requirement for using a Folder will come by make and model number, and that is the way you should file them. PHOTOFACT Folder Numbers are very important to us, because we use them in scheduling; but to the purchaser, the PHOTOFACT Folder Number has value only for identifying an individual folder, for the purpose of replacement, should this be required because of obsolescence, error, loss, or because the Folder has just naturally worn out through use.

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NOW AND LATER

SQUARES AND CIRCLES

The chassis pictures in PHOTOFACT Folders have arrows and numbers to identify the parts. Commercial artists call these arrows and numbers "call-outs" and we think it is an appropriate name.

We have two kinds of "call-outs" in our chassis pictures—the plain numbered variety, and the ones with the prefix "A"—thus A1, A2, etc. The plain numbered "call-outs" point out components; and A prefix "call-outs" point out adjustment points. Service men have universally praised this feature because of the really big saving of time it effects in aligning receivers.

Beginning with PHOTOFACT Folder Set No. 6, we are improving the call-out system even further. Adjustment or A-prefix call-out

numbers will be boxed in squares; component part call-out numbers will be boxed in circles. This will make the designations of the adjustment points stand out even more clearly, and will further speed the work. Here is another evidence of our intention to make each issue of PHOTO FACT Folders even more valuable and useful than the preceding.

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ACCUMULATIVE INDEX

A number of our patrons have written, asking us why we have not included a separate index sheet on PHOTO FACT Folders since Set. No. 2. The omission has been deliberate because an index covering the contents of each individual PHOTO FACT Folder Set is printed on the envelope.

It is anticipated of course that users will combine their PHOTO-FACT Folder Sets, and file them alphabetically by make and numerically by model as suggested in the "How to Use" Folder included with Set No. 1. This will permit any individual folder to be located quickly.

A cumulative index will be included in PHOTO FACT Folder Set No. 6. Subsequent issues of the Cumulative Index will be printed quarterly. Most of you asked for indexes semi-annually; but we thought no one would object to having them a little oftener. Please continue to tell us what you want in PHOTO FACT Folders—we will tailor them to your needs.

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INSTITUTE NOTES

Did you ever wonder just what our Institute mail looks like?

An analysis reveals some very interesting things. First in volume of our mail continues to be "Testimonials"—letters from users who ask no special favors or services, but who simply write to tell us how glad they are that PHOTO FACT Folders are available, and how these FOLDERS save effort and speed servicing. They're really helpful to us.

Next in volume are requests for hard-to-get schematics. We have one of the finest "morgues" of Factory Service Manuals in the country, and we are always glad to help when we can.

A lot of patrons are still asking us to provide PHOTO FACT Folders on pre-war sets . . . and we would sure like to do so. However, we get our data by measuring and photographing sample chasses, and you will understand how difficult it would be to get samples of the older receivers for this purpose. Besides, compilations of schematics on pre-war receivers are available from other sources and can be purchased from your radio parts supply house. Our business is to bring you complete service information on all the new receivers . . . fresh as your morning newspaper . . . so that you will have the data in your shop before the 90-day factory service guarantee expires. A whale of a lot of receiver models are being placed on the market, this year of 1946, and we got a late start. However, before the first of the year we hope to achieve our goal of being current with receiver production.

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We get a lot of letters from patrons asking for special technical information; and if these questions relate to the repairing of the defective receivers we do everything that is humanly possible to aid them. Sometimes the information is not here in our files, and to get the answer we have to contact a number of manufacturers. This is particularly true when a customer asks for information on a hard-to-get repair part for one of the older sets. This takes time; and in such cases we must ask your indulgence and patience. You will hear from us as soon as possible.

There are several kinds of questions we cannot answer.

(a) **"How to build it" data**—We do not believe that it is right to give constructional data without building a sample first to make sure the design is right; and we just haven't the time to do this.

(b) **Examination and Trade License Questions**
We explained about this in PHOTO FACT Services No. 9—it's not fair.

(c) **Questions on "Improving"** radio receivers by adding stages, and making major circuit changes.

This actually comes under the same category as the "How to build it" data; but we must list this subject separately because of the number of calls we get from experimenters for such information.

It is easy to develop a schematic diagram and constants for such a change, but to find a place to fit in the added parts is something else. In addition, it is impossible to tell without a trial whether the resulting job will be stable. It's our belief that the service man's job is done when he restores the receiver to a "like new" operating condition. If the customer wants something better, then it's time to turn salesman and sell him a new set. We do not wish to encourage experimentation on a customer's receiver—even less would we like to be responsible for any non-workable data that would lead to the damaging of the receiver.

After all, the way to make money is to repair each set with minimum of time and effort—do a bang-up job for the customer, and deliver the set in a hurry.

Frankly, we deplore the use of the word "laboratory," as the name for a repair shop. It implies experimentation, and that's not either the way to make money or to keep customers happy.

Last but not least is the requests we get for diagnosis of receiver trouble. We'll stick our neck out, and try to answer such requests if you'll give us complete data. But we must have full details, including make and model of receiver, symptoms, voltage analysis, and information on what has been done thus far to correct the trouble. We have some "old timers" on our staff who have had a lot of experience repairing sets, and our patrons tell us we have a pretty good knack of hitting the nail on the head!

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JUST TO REMIND YOU...

Here are the high-lights of important things we have told you in previous issues of the PHOTO FACT Servicer:

Changes and errors will be detailed starting in Set No. 6. In other words PHOTO FACT Folders will always be kept up-to-date.

If you want us to demonstrate PHOTO FACT Folders at one of your Service Meetings have your Secretary write and arrange a booking.

If you didn't get Set No. 1 and a copy of "How to Use It" tell us—we will gladly send you a copy Free. It tells you how to use and how to file PHOTO FACT Folders and how to become a member and keep your membership active in the Howard W. Sams Institute. (You can always send your check to us for back numbers. We will see that they are shipped promptly.)

There's no charge for exchanging imperfectly printed folders. If you have one send it back and we will gladly exchange it.

Be sure to write and tell us of your field experiences. You'll be given full credit for them and you'll be helping others.

Don't forget, *please*—Tell us what receivers you want analyzed first—what replacement parts manufacturers you want us to list and how we can be of more help to you.

We hope that during the coming months, many of you will find it possible to visit us and see for yourself what we are doing. The latchstring is always out so come whenever you can. Our new telephone numbers are MArket 6383 and MArket 6384.

PUBLICATION DATES

When will other sets of PHOTO FACT Folders be published?

Set No. 6 . . . . . October 28
Set No. 7 . . . . . November 19
Set No. 8 . . . . . November 29

Use the order blank accompanying this set of Folders—address the envelope and send it to your radio parts supply house—they will do the rest.

Through the courtesy of the ZENITH RADIO CORPORATION
we are privileged to bring you these Service Notes on

ZENITH 1946 RECEIVERS

CHASSIS 5C01—6C01—6C05

Distortion and Poor Sensitivity

Distortion and poor sensitivity usually caused by a short between turns on the wave-magnet.

Poor sensitivity and set fails to operate on low frequency end of dial—replace oscillator coil.

Uncontrolled Oscillation

A 470,000 ohm carbon resistor soldered across the secondary of the first IF transformer will correct this condition.

CHASSIS 6C40 MODEL 6G001

Blocking

The AC Plug being inserted in the battery saver switch socket while the on-off switch is ON may cause the set to block and become dead. Switching the set off and on will relieve this blocked condition and return the set to normal operation.

CHASSIS 8C01 AC-DC { MODEL 8H023- MODEL 8H034

Modulation Hum

Under humid conditions, the insulating material inside the AC plug, and the back cover will absorb moisture, and if the solder lug is in contact with this material, some of the AC voltage will leak into the back cover. Since this back cover is next to the loop, hum modulation will be evident.

To remedy this condition, remove the back from the receiver, open the AC connector, and bend the solder lug away from the insulating wall. A vinylite sleeve over the solder lugs will insure good insulation.

Hum Level Increases as the Volume Control is Advanced

Hum in the 8C01 chassis may be caused by an open .05-200V condenser which is connected between the metal shell of the volume control and chassis. Replacing this condenser will correct the hum condition.

Audio Howl on FM

This condition may be corrected by:

1. Installing Zenith Part No. 83-1328 plastic spacer between the centers of the oscillator and detector slug shafts. This will prevent the slugs from vibrating.
2. Floating speaker by mounting it on rubber grommets.
3. Installing Zenith Part No. 166-36 felt cushion between the back of the gang tuning capacitor and the adjacent IF transformer.
4. Improving the floating of the gang capacitor by removing the support screw nearest the dial.

CHASSIS 8C20—8H0 SERIES
CHASSIS 8C21—9H0 SERIES

PM Speakers 8H0 and 9H0 Series

Some of the earlier 8C20-21 chassis are wired for electro-dynamic speakers only. Later production sets are wired for either electro-dynamic or PM speakers which have the filter unit attached to the speaker frame. These chassis are identified by a dot of black paint on or near the speaker socket. To use the PM speakers on the earlier sets, it will be necessary to run a lead from B— (Center Tap of high voltage winding) to a lug on the speaker socket which connects to the negative side of the filter on the speaker.

Buzz in Dial Escutcheon 8H0 and 9H0 Series

If the dial assembly comes in contact with the power transformer, a buzz will result and a Zenith Part No. 83-1331 felt spacer should be added between the dial and the transformer.

Stripped IF Slug Inserts

Damaged IF slug thread inserts may be replaced by unscrewing the slug and pushing out the old insert.

Two types of inserts are used, Zenith Part No. 83-1063 (short insert) and Zenith Part No. 83-1069 (long insert).

Increasing Bass Response of Phono

To increase the bass response on records, the value of the pre-amplifier plate filter resistor (now 2700 ohms) may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

Improving FM Reception on 8H0 and 9H0 Series

In FM Consoles, a cabinet FM antenna may be added in addition to the line antenna. This antenna is

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made up of two 28″ lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

Wave Trap Trimmer Shorting Out

A .002 mfd. 600-volt capacitor has been added in series with the grounded side of the wave trap. Adding this capacitor removes the DC potential from the trap and eliminates the possibility of breakdown.

Audio Howl as Volume Control is Advanced (FM Reception)

On FM reception an audio howl may be caused by sympathetic vibration between the speaker and the oscillator tuning slug. A fiber spacer between the oscillator slug shaft and the detector slug shaft in the FM tuner will eliminate this vibration. A thin rubber band tied to the center of the oscillator slug shaft and the upper frame will also eliminate the audio howl.

Howl on AM Reception (8H0 Series)

Howl due to vibrations transmitted into the oscillator sections of the gang condenser by the speaker. To remedy this condition, a felt strip can be placed between the rear of the gang capacitor and the first IF transformer. It may also be necessary to move the oscillator section lead underneath the gang slightly to reduce tension.

Hum Complaint on 9H0 Series

Check audio and AC leads to the volume control. The leads from this control must be dressed away from the AC leads. The high voltage secondary leads from the power transformer must be dressed away and close to the chassis from the 47,000 resistor on the tap points.

CHASSIS 8C40—MODEL 8G005

Microphonics

Howl caused by microphonic 1LD5 tube. The construction of these tubes has been improved and all tubes bearing code dates after F6E (June 1946) are non-microphonic. The older type should be replaced with those produced after the above date.

CHASSIS 11C21—11C21Z (12H0 SERIES)

Differences in 11C21-11C21Z Chassis

Sets using chassis 11C21Z are equipped with PM speakers. PM speakers cannot be used on 11C21 chassis. When ordering speaker replacements specify 11C21 or 11C21Z chassis.

Improving FM Reception

In FM Consoles a cabinet FM antenna may be added in addition to the line antenna. This antenna is made up of two 28″ lengths of wire. One wire is connected to the FM antenna post, the other to chassis. The two wires are then tacked in the cabinet in opposite directions, and should not come in contact with ground.

Hum Complaint

Check for excessive length of the AC line cord inside the main chassis between the point of entrance and the solder lugs. This slack may be in close proximity to the tone control leads.

Stripped IF Slug Inserts

Damaged IF slug thread inserts may be replaced by unscrewing the slug and pushing out the old insert.

Two types of inserts are used, Zenith Part No. 83-1063 (short insert) and Zenith Part No. 83-1069 (long insert).

Wave Trap Trimmer Shorting Out

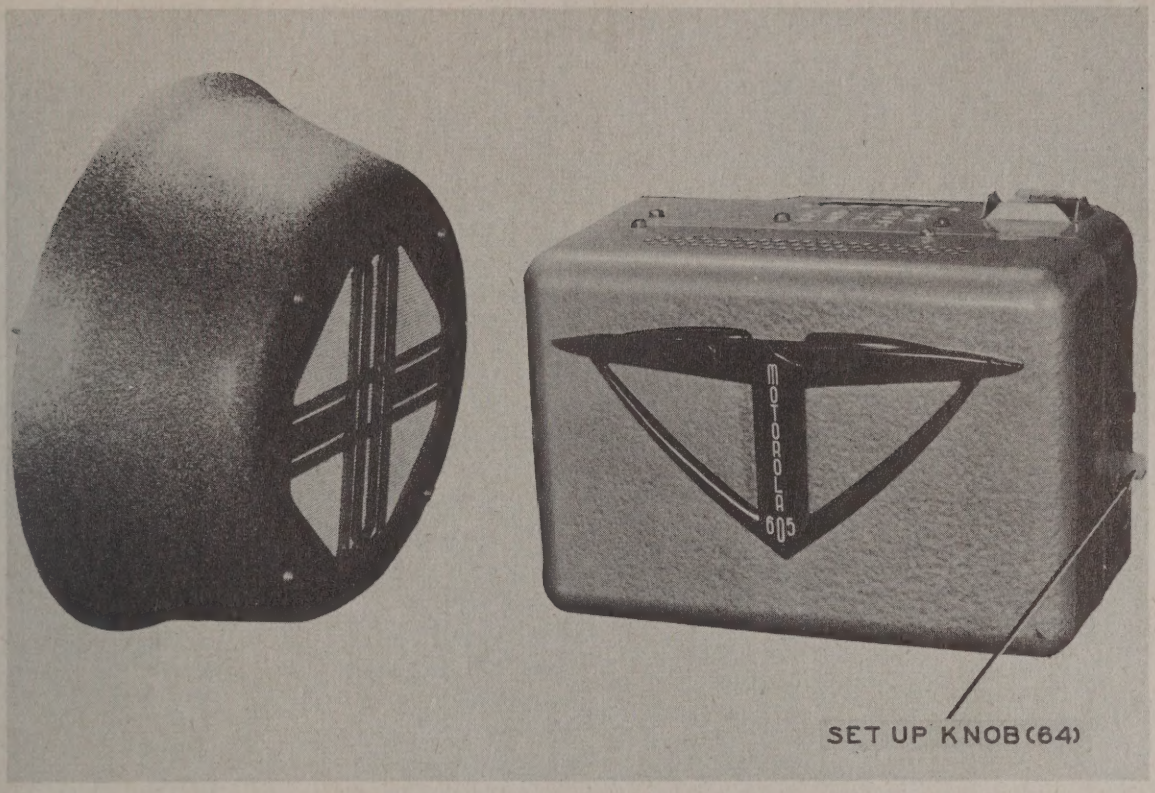
A .002 mfd. 600-volt capacitor has been added in series with the grounded side of the wave trap. Adding this capacitor removes the DC potential from the trap and eliminates the possibility of breakdown.

Increasing Bass Response of Phono

To increase the bass response on records, the value of the pre-amplifier plate filter resistor (now 2700 ohms) may be increased. Do not increase the value to over 10,000 ohms or audio howl may be heard.

Howl on FM

FM howl may be caused by the speaker vibrating the oscillator slug. A fiber spacer between the oscillator and detector slug shafts in the FM tuner will eliminate vibration. A thin rubber band tied to the center of the oscillator slug shaft and upper frame will also eliminate the howl.



MOTOROLA
MODEL 605

MOTOROLA
MODEL 605

MOTOROLA MODEL 605

TRADE NAME	Motorola Model 605 (Chassis AS-15)
MANUFACTURER	Galvin Mfg. Corp., 4545 W. Augusta Blvd., Chicago, Ill.
TYPE SET	Superheterodyne Dual Unit Automotive Set with Automatic Tuning
TUBES (SIX)	Types, 6SK7GT RF Amp., 6SA7GT Converter, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6V6GT Power Output, 6X5GT or OZ4 Rectifier.
POWER SUPPLY	6.3 Volts DC RATING 8.6 Amps. @ 6.3V DC
TUNING RANGE—BROADCAST	535-1600KC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #8 of 6SA7. Low side to chassis.	455KC	High freq.end (Tuning control fully clockwise).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
60 MMF and 21" coaxial lead. Capacitor at gen.end.	Antenna receptacle	1600KC	High freq.end Cores are to be projecting 1-1/8" from ends of cans and tuning against stop.	"	A5,A6, A7.	Adjust for maximum output in order given.
"	"	1425KC	Exactly one full turn from high freq.end.	"	56 55 54	Adjust cores for maximum output. Mark manual tuning shaft coupling to indicate full turn.
"	"	Gen. power off but leave connected.	Four more full turns in.	"	A8	Adjust for maximum noise.
			1400KC	"	A7	Install set in car and connect antenna. Adjust for maximum noise.

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"The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed."
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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SK7GT	6SK7GT	8N	
2	Converter	6SA7GT	6SA7GT	8AD	
3	IF Amp.	6SK7GT	6SK7GT	8N	
4	Det.-AVC-AF	6SQ7GT	6SQ7GT	8Q	
5	Power Output	6V6GT	6V6GT	7AC	
6	Rectifier	6X5GT	6X5GT	6S	0Z4 Type, RMA Base Type 4R also used.

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	30	300	23A27718	FP331	DY-2x30-350/50-50	EL-323	AF44J	UP6BJ38	▲ Filter
B	30	350					PRS50-25		■ "
C	20	25						BR202A	"
8	.006	1600	8A12840-A	OW344	XTIMS10-.006	TR-26	1684-.006	MD16D6	Buffer
9	.5	100	8A19133-B	TP431	S-4-1	TC-5	484-.5	DT4P5	Hash Filter
10	.5	100	8A19133-B	TP431	S-4-1	TC-5	484-.5	DT4P5	" "
11	.006	400	8A71910	TP409	S-6-006	TC-26	484-.006	DT6D6	6V6 Plate Bypass
12	.004	400	8A71909-A	TP407	S-6-004	TC-24	484-.004	DT6D4	Tone Compensation
13	.03	400	8A71911-0	TP424	S-4-03	TC-13	484-.03	DT4S3	Audio Coupling
14	.01	400	8K23690	TP421	S-4-01	TC-11	484-.01	DT4S1	" "
15	.05	400	8A14791-A	TP426	S-4-05	TC-15	484-.05	DT4S5	Muting Cap.
16	.01	400	8K23690	TP421	S-4-01	TC-11	484-.01	DT4S1	Tone Compensation
17	.1	400	8K12166-D	TP428	S-4-1	TC-1	484-.1	DT4P1	Plate Bypass
18	.05	400	8A14791-A	TP426	S-4-05	TC-15	484-.05	DT4S5	Screen Bypass
19	.5	100	8A19133-D	TP431	S-4-5	TC-5	484-.5	DT4P5	Solenoid Shunt
20	.05	400	8A14791-A	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
21	.006	100		TP409	S-6-006	TC-26	484-.006	DT4D6	Ant. Coupling
22	250	500		MC240	MO.5-325	1FM-325	1468-.00025	5W5T25	Audio Plate Bypass
23	50	500		MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	AVC Coupling
24A	120								Diode Filter
B	120								" "
25	400								Fixed Trimmer-Ceramic
26	50	500		MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	Osc. Grid Cap.
27	5								RF Coupling - Ceramic
28	90								Ant. Filter - Ceramic

CONTROLS

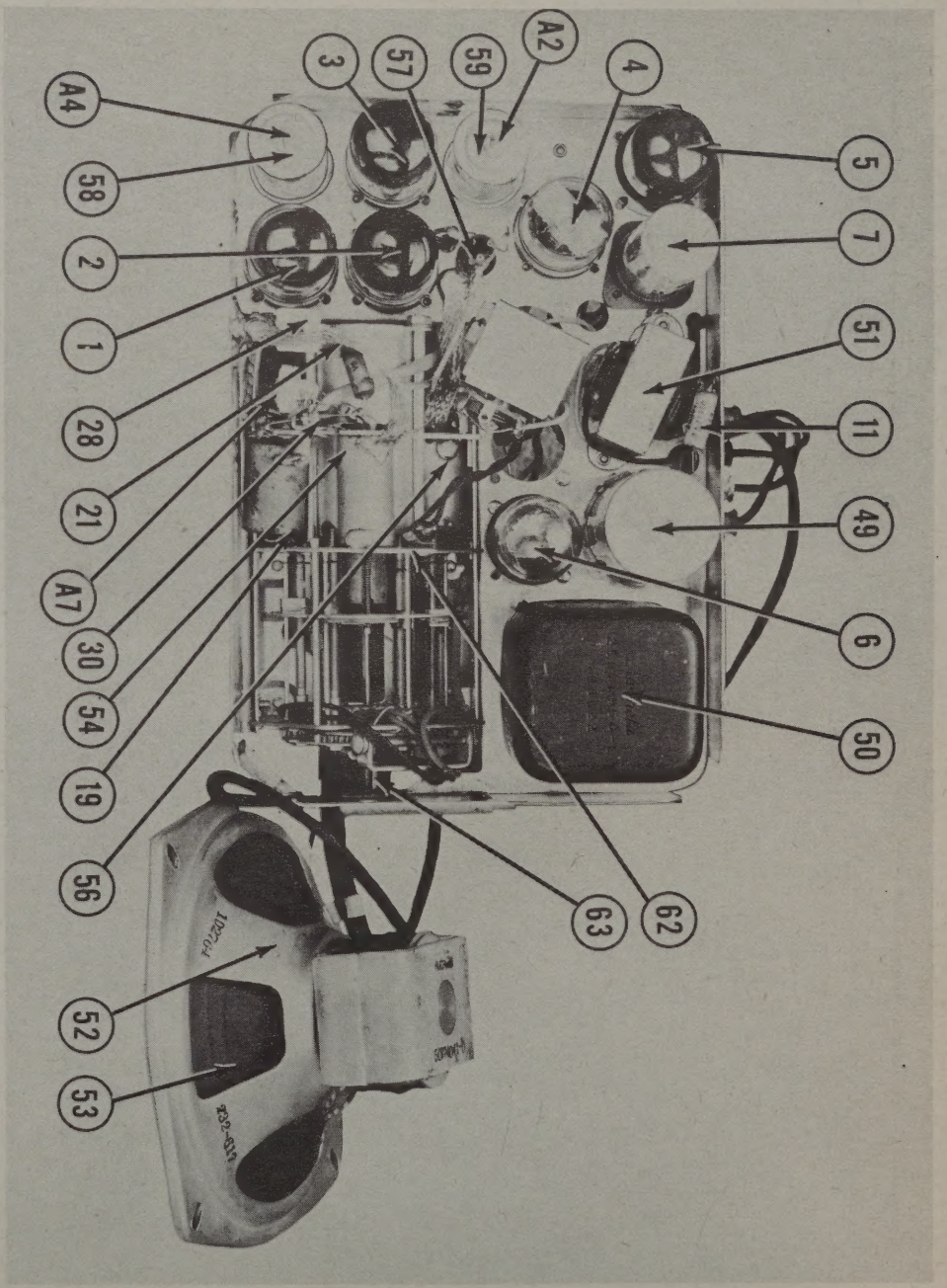
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
29A	500KΩ	1	18A71925-0	TM233	D18-133X		Volume Control
B	Shaft		Not Req.	S519	A & C3*		Attach to 29A per instructions
C	Switch		" "	M26	41		" " " " "

*Use IRC "A" Shaft and "C3" coupler with part of original shaft and square hole insulated coupler.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
30	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. AVC Network
31	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Converter Grid
32	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Osc. Grid
33	22KΩ	1		BTA-22K	Red-Red-Or. Screen Dropping
34	22KΩ	1		BTA-22K	Red-Red-Or. " "
35	330Ω	1		BTA-330	Or.-Or.-Br. Plate Filter
36	22KΩ	½		BTS-22K	Red-Red-Or. Tone Compensation
37	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
38	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
39	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. 1st AF Grid
40	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. 1st AF Grid
41	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
42	220KΩ	½		BTS-220K	Red-Red-Yl. Output Grid
43	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Diode Load

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONTINUED)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
44	180Ω	1		BW-1-180	Br.-Gray-Br. Voltage Divider Bias
45	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Voltage Divider Bias
46	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter
47	50Ω	1		BW-1-47	Grn.-Blk.-Blk. Hash Suppression
48	50Ω	1		BW-1-47	Grn.-Blk.-Blk. Hash Suppression

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA			INSTALLATION NOTES
				MOTOROLA PART No.	MALLORY PART No.	RADIART PART No.	
49	Interrupter	6	115~	3333	859	5342M	

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	THORDARSON PART No.	
50	5.7 VDC @ 4.2A	530V CT @ .05A			25B70950-E	P-4062*	T-14R35*	*Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
51	6450Ω	4Ω	370Ω	.6Ω	25B70171-E	A-3679	T-14S84		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.		
	FIELD RES.	VC IMP.				
52	4.25Ω	4Ω	50B74041-0	ST-432		
	CONE DIA.	VC DIA.				
53	6-1/16"	11/16"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

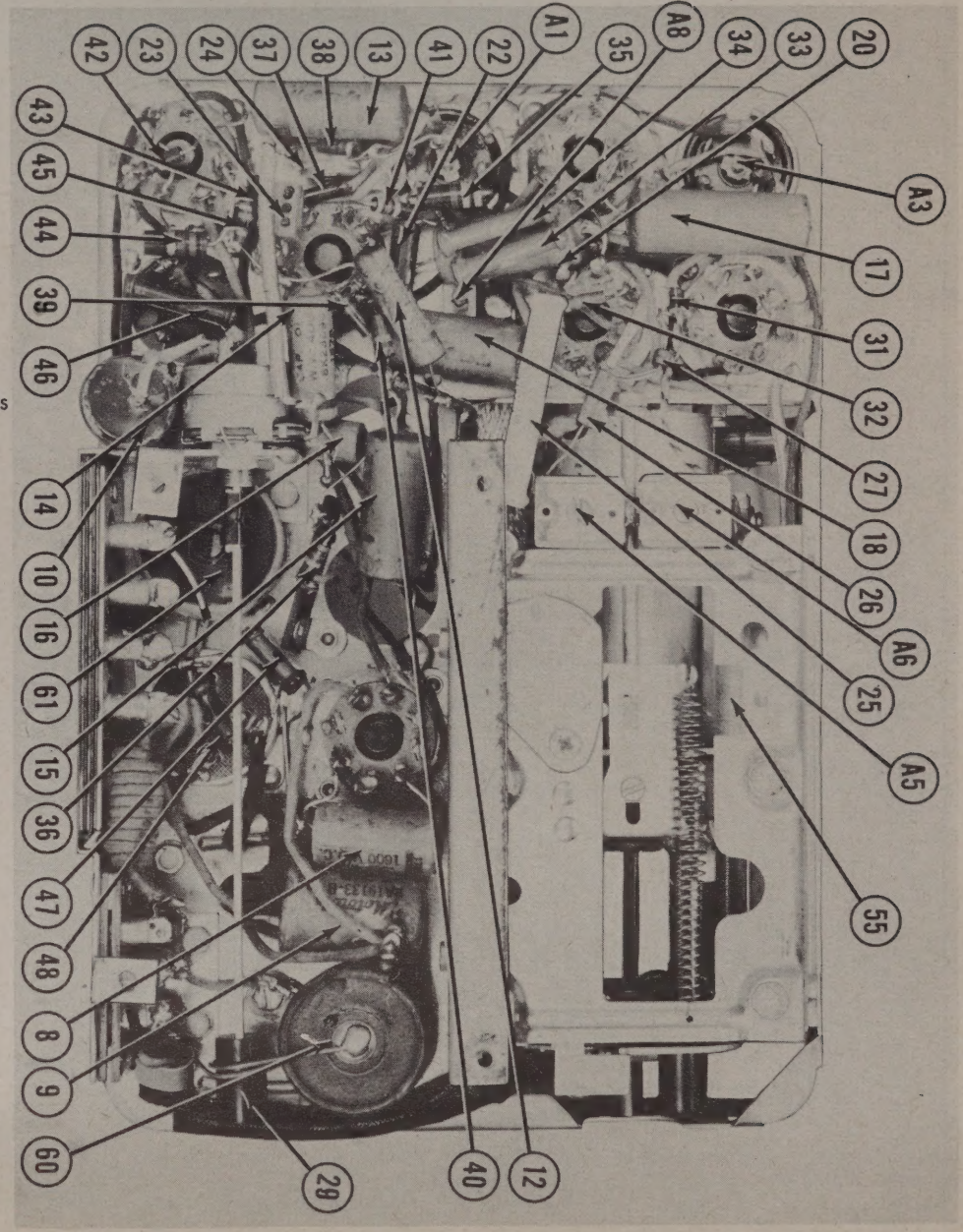
R F COILS

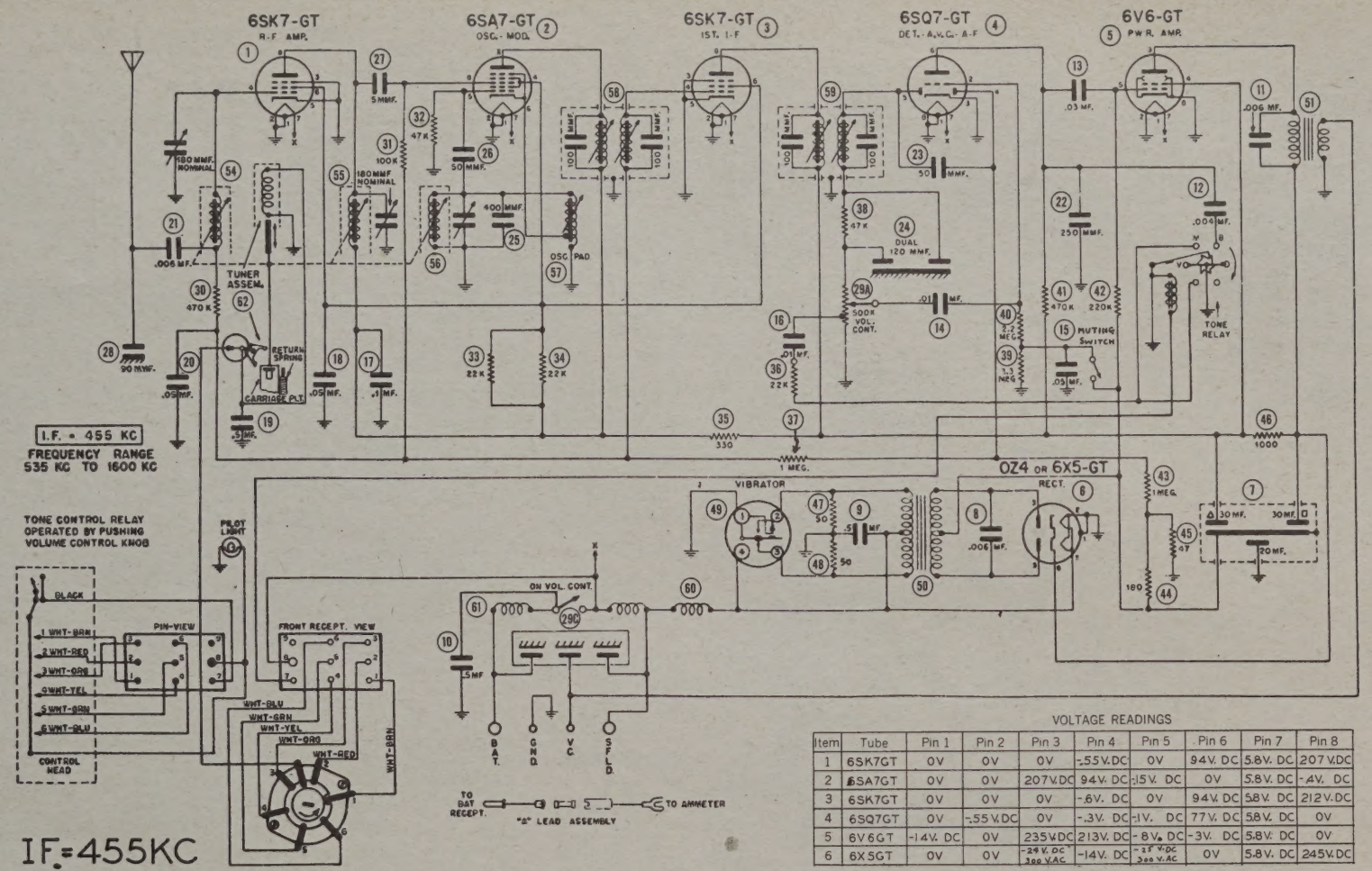
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
54	Ant. Coil		12.8Ω			Items 54, 55, 56, ganged together, slug tuned.
55	RF Coil		12.2Ω			
56	Osc. "		1.8Ω			
57	Osc. Padder	2Ω				
58	Input IF	16Ω	14.9Ω		16-6666	
59	Output IF	15.5Ω	16.2Ω		16-6667	
60	Vib. RF Choke	0Ω				
61	Bat. RF Choke	0Ω				

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
62	Tuner Assby.		
63	Set-up Button		
64	Set-up Button		

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0V	0V	0V	-.55V.DC	0V	94V. DC	5.8V. DC	207 V.DC
2	6SA7GT	0V	0V	207V.DC	94V. DC	-15V. DC	0V	5.8V. DC	-4V. DC
3	6SK7GT	0V	0V	0V	-.6V. DC	0V	94V. DC	5.8V. DC	212V.DC
4	6SQ7GT	0V	-.55V.DC	0V	-.3V. DC	-1V. DC	77V. DC	5.8V. DC	0V
5	6V6GT	-14V. DC	0V	235V.DC	213V. DC	-8V. DC	-3V. DC	5.8V. DC	0V
6	6X5GT	0V	0V	-29V. DC 300 V.AC	-14V. DC	-29V. DC 300 V.AC	0V	5.8V. DC	245V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0Ω	0Ω	0Ω	2.4 MEG	0Ω	70KΩ	.25Ω	55 KΩ
2	6SA7GT	0Ω	0Ω	55KΩ	70KΩ	38KΩ	.5Ω	.25Ω	2 MEG
3	6SA7GT	0Ω	0Ω	0Ω	1.9 MEG	0Ω	70KΩ	.25Ω	55 KΩ
4	6SQ7GT	0Ω	5 MEG	0Ω	950KΩ	670KΩ	520KΩ	.25Ω	0Ω
5	6V6GT	210Ω	0Ω	55KΩ	55KΩ	185KΩ	45Ω	.25Ω	0Ω
6	6X5GT	0Ω	0Ω	480Ω	210Ω	510Ω	I N F	.25Ω	55 KΩ

PUSH BUTTON ADJUSTMENTS

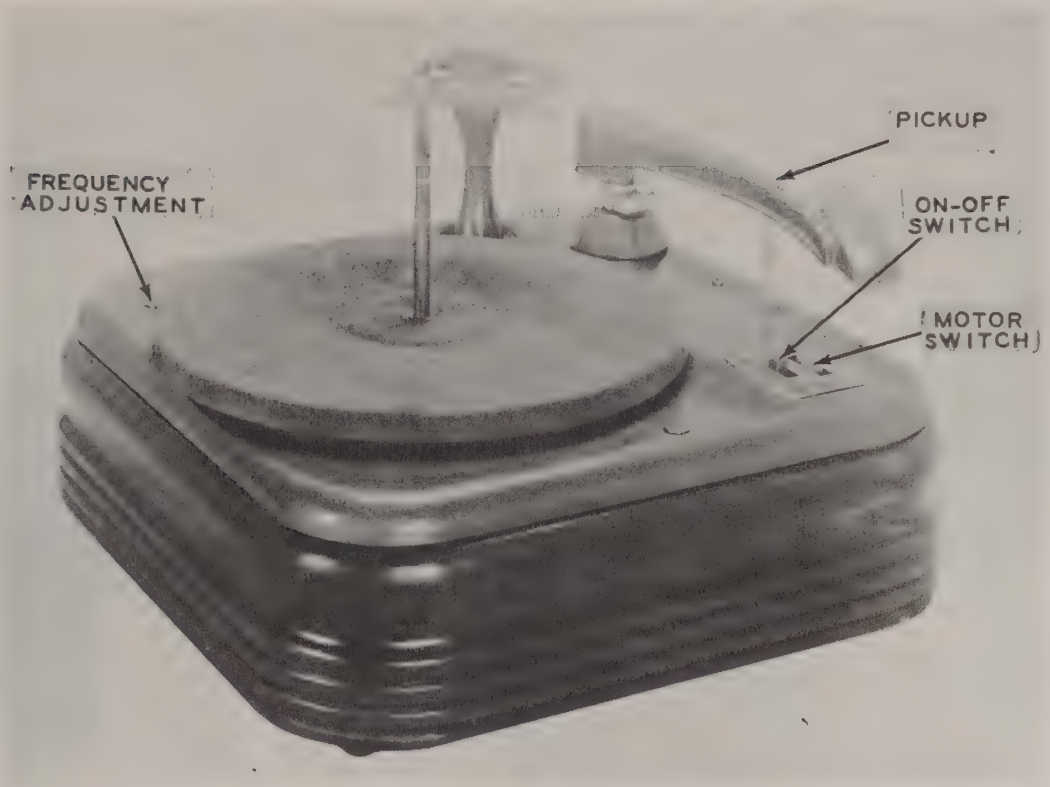
1-Collapse antenna until signal is weak.
2-Press manual "M" button on control head.
3-Turn tuning knob until desired station is tuned in-note program.
4-Press desired button and hold in until tuning mechanism completes its operation.
5-Press "set-up button" (63) until "click" is heard.
6-Turn "set-up knob" (64) until previously noted program is heard.
7 Repeat the above procedure for each additional station desired.

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

At the request of the manufacturer stage gain measurements are not included.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Battery voltage maintained at 6.3 volts at battery terminals for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.



MOTOROLA
MODEL WR6

MOTOROLA
MODEL WR6

MOTOROLA MODELS WR6, WR7, WR8

TRADE NAME	Motorola Models WR6, WR7, WR8 (Chassis HS-18)
MANUFACTURER	Galvin Mfg. Corp., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	AC Operated Automatic Wireless Record Player
TUBES (TWO)	Types, 6SK7GT Oscillator-Modulator, 6J5GT Rectifier.
POWER SUPPLY	117Volts AC
RATING	.05 Amps. @ 117V AC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0V.	0V.	0V.	-.7V.DC	8.6V.DC	84V.DC	6.6V.AC	8 2V.DC
2	6J5GT	0V.	0V.	87V.AC	0V.	87 V.AC	0V.	6.6V.AC	100V.DC

BIAS CONTROL IN NORMAL OPERATING POSITION

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7GT	0 Ω	0 Ω	4 MEG	50K Ω	2.2K Ω	110K Ω	.5 Ω	90K Ω
2	6J5GT	0 Ω	0 Ω	390 Ω	INF	390 Ω	INF	.5 Ω	78K Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		MOTOROLA PART No.	STANDARD REPLACEMENT		
1	Osc.-Mod.	6SK7GT	6SK7GT	8N	
2	Rectifier	6J5GT	6J5GT	6Q	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	MOTOROLA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
3A	10	150	23A20887	3N527	DSb-3X20-150	TA-122	PRS150-20-20	EZ32115	Filter - Red
B	10	150							" - Yellow
C	10	150				UT-121	PRS150-12		" - Green
4	.05	400	8S9816	TP426	S-4-05	TC-15	484-.05	DT4S5	Line Bypass
5	.05	400	8S9816	TP426	S-4-05	TC-15	484-.05	DT4S5	" "
6	1000	500	21R6638	MC255	MO.3-21	1FM-21	1468-.001	1W5D1	Phono Coupling
7	25	500	21R6535	MC220	MO.5-425	MS-425	1468-.000025	5W5Q25	Ant. Coupling
8	100	500	21R6641	MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	Osc. Grid Cap.
9	25	500	21R6535	MC220	MO.5-425	MS-425	1468-.000025	5W5Q25	Feedback

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	MOTOROLA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
10	10KΩ	1	18A20889				Bias Control

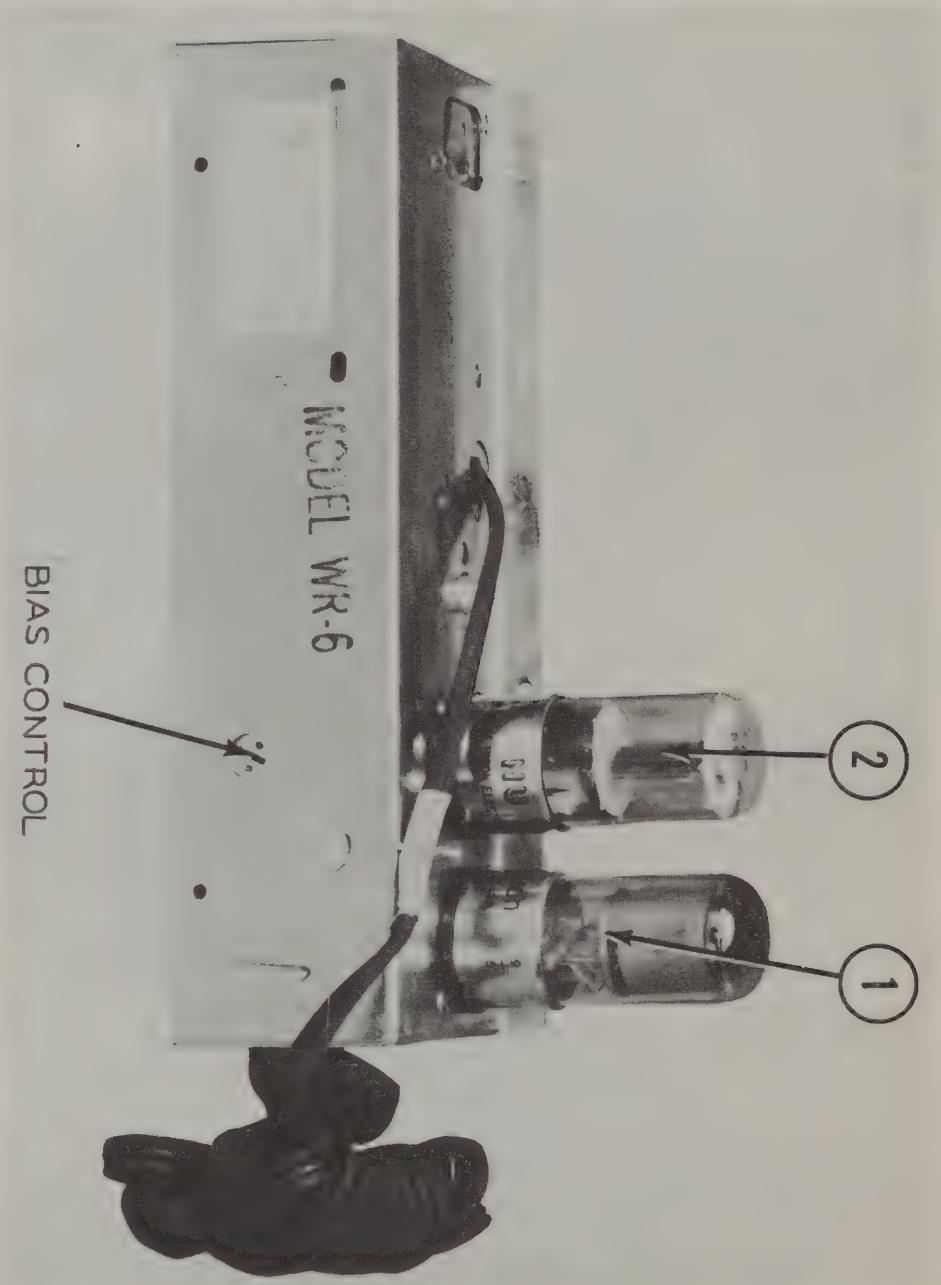
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	MOTOROLA PART No.	IRC PART No.	
11	47KΩ	½	6R6056	BTS-47K	Yl.-Vi.-Or. Osc. Grid
12	4.7 Meg.	½	6R2122	BTS-4.7 Meg	Yl.-Vi.-Grn. Phono Load
13	4700Ω	½	6R6101	BTS-4700	Yl.-Vi.-Red Filter

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	THORDARSON PART No.	INSTALLATION NOTES
14	117VAC @ .050A	84VAC @ 4.6MA	6.4VAC @ .6A		25A17449			

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
15	Osc. Coil	4.8Ω	6.7Ω	24A20892		

SERVICE NOTE

When the tubes are renewed, or if the music is distorted, reset the oscillator adjustment (bias control) under the chassis, as follows:

1 - Let the instrument overhang the edge of a table or console so the control is accessible from below.

2 - Turn the oscillator bias control fully counter-clockwise (see photo).

3 - Start the record player and tune in the record on the radio.

4 - Push the left-hand switch to center position, thereby stopping the motor.

5 - Turn the control fully clockwise; the carrier should disappear.

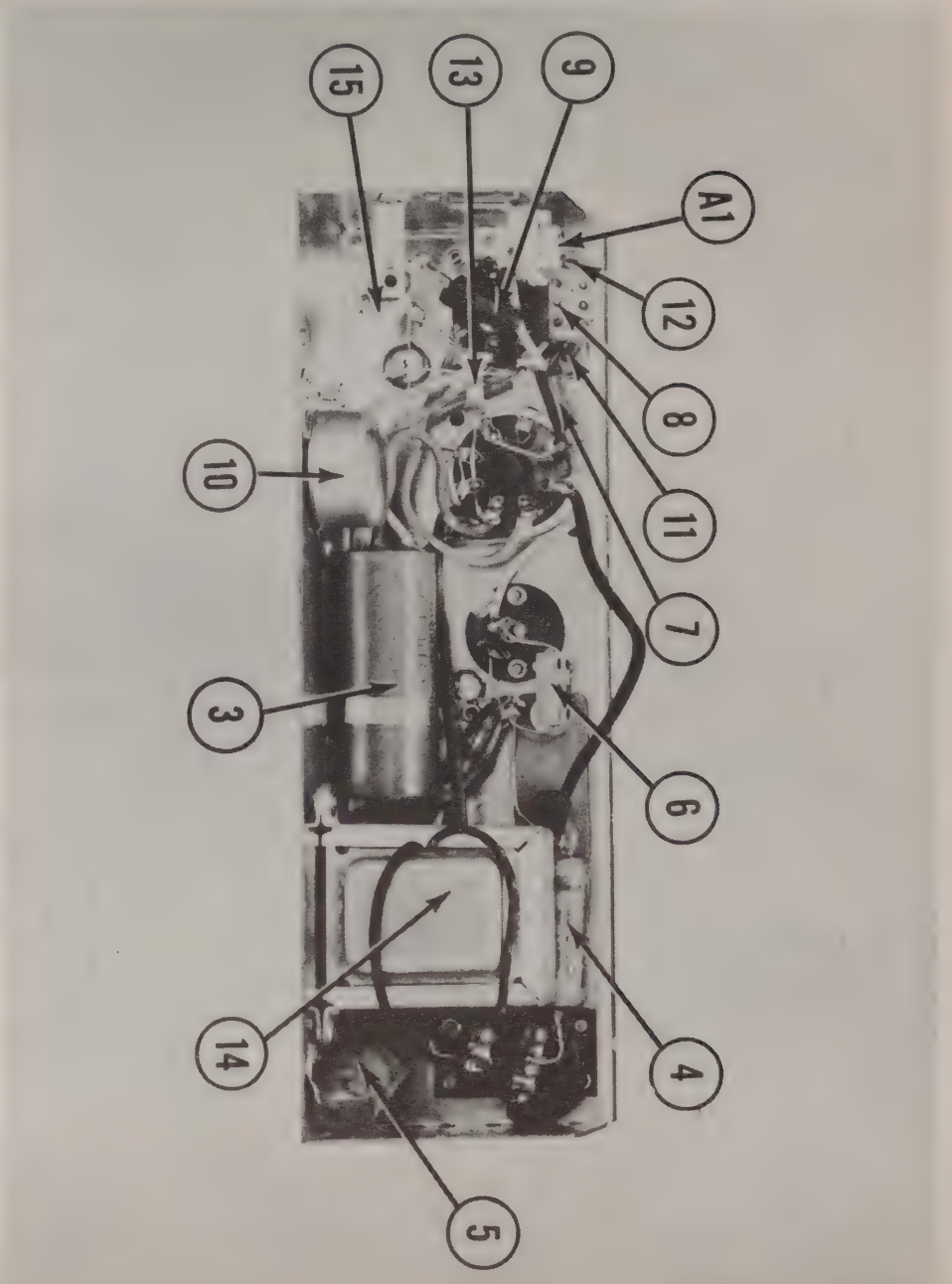
6 - Very slowly turn the control back in a counter-clockwise direction until a "plop" is heard in the radio speaker.

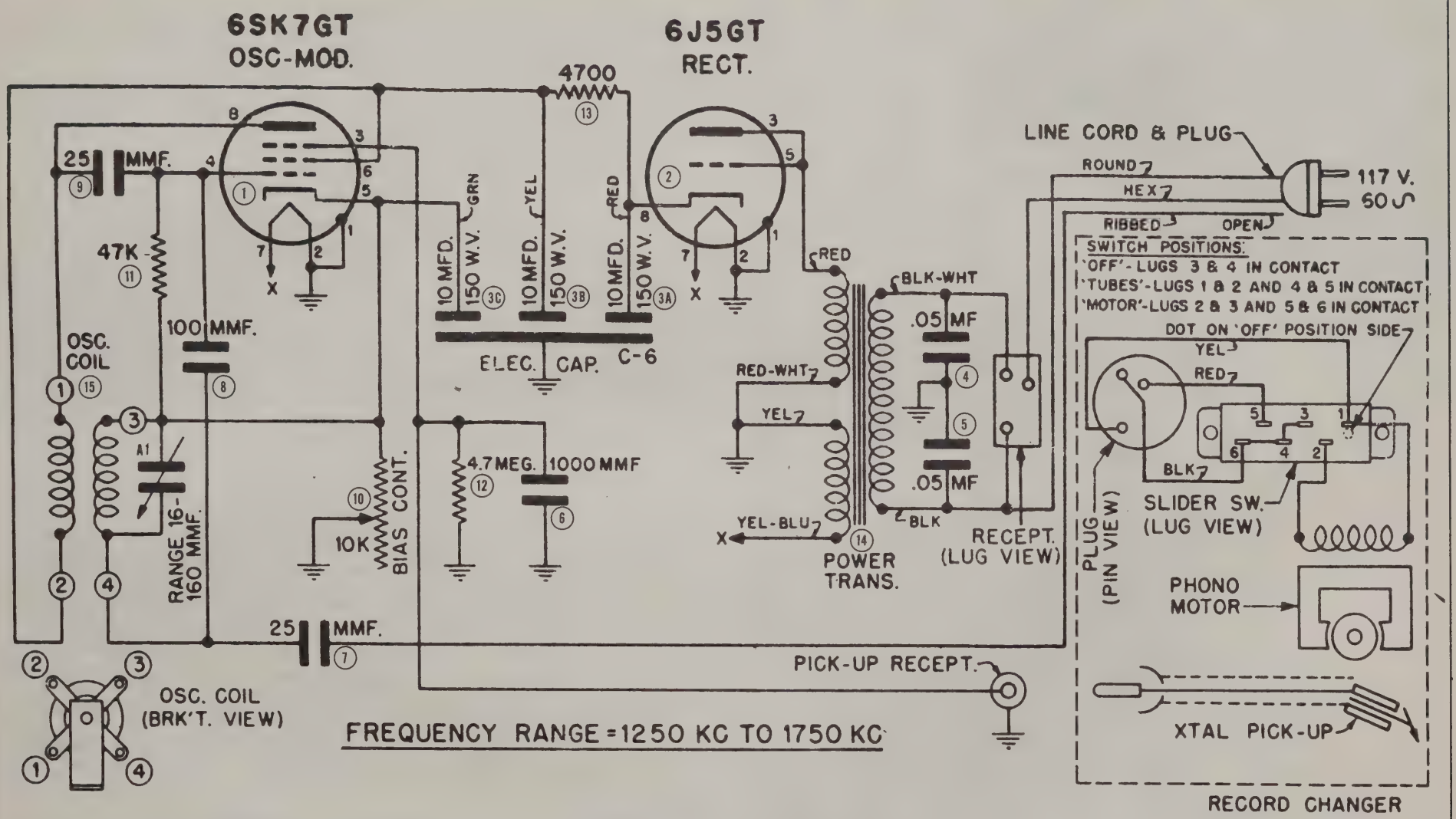
7 - The control should remain in the position where the "plop" is heard.

TO CHANGE FREQUENCY

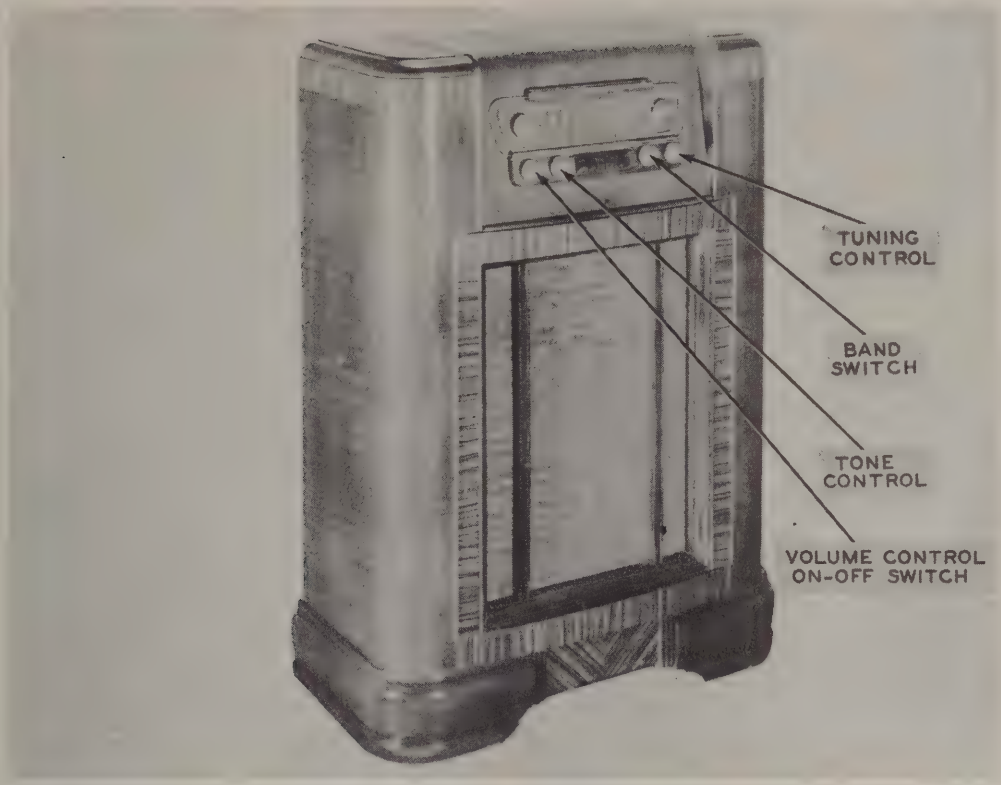
A 1 is factory adjusted at 1560KC. If a strong radio station is received at this frequency, adjust A 1 to another frequency free from interference as follows: Tune radio to some position between 1250KC and 1700KC where there is no radio station interference. With record player operating, adjust A 1 (remove plug button on top of unit) until the recorded music is heard through the radio. For frequency lower than 1560KC, turn A 1 clockwise. For frequency higher than 1560KC, turn A 1 counter-clockwise.)

CHASSIS—BOTTOM VIEW





The cooperation of the manufacturer of this receiver makes it possible to bring you this service.



MOTOROLA
MODEL 85K21

MOTOROLA
MODEL 85K21

MOTOROLA MODEL 85K21

TRADE NAME	Motorola Model 85K21 (Chassis HS-52)
MANUFACTURER	Galvin Mfg. Corp., 4545 Augusta Blvd., Chicago, Ill.
TYPE SET	AC Operated 2 Band Superheterodyne - Self Contained Loop Antenna & Automatic Tuning
TUBES (EIGHT)	Types, 6SG7 Converter, 6J5 Oscillator, 6SG7 IF Amp., 6SQ7 Det.-AVC-AF, 6SQ7 Phase Inverter, 2- 6K6GT Power Output, 5Y3GT Rectifier
POWER SUPPLY	117 Volts AC — Rating .700 Amps. @ 117V AC
TUNING RANGE—BROADCAST	535-1620KC — **SHORT WAVE** 5.6 - 12.2 MC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #4 of 6SG7 mixer. Low side to chassis.	455KC	BC	High freq. end of dial.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
	Loop	1600KC	"	1600KC	"	A5	Adjust for maximum output. Connect output of signal generator to loop of few turns of wire and radiate signal into receiver loop.
	"	1400KC	"	Tune in 1400 KC signal.	"	A6	"
400Ω res.	High side to ext. ant. Low side to chassis.	12MC	SW	12MC	"	A7,A8.	Adjust for maximum output

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MOTOROLA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	6SG7	6SG7	8BK	
2	Oscillator	6J5	6J5	6Q	
3	IF Amp.	6SG7	6SG7	8BK	
4	Det.-AVC-AF	6SQ7	6SQ7	8Q	
5	Phase Inverter	6SQ7	6SQ7	8Q	
6	Power Output	6K6GT	6K6GT	7S	
7	Power Output	6K6GT	6K6GT	7S	
8	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MOTOROLA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
9A	30	350	23A27718	FP331	DY-2x30-350/50-50	EL-323	AF32K4A	UP6BJ38	■ Filter
B	30	300							▲ "
C	20	25						BR202A	"
10	.005	600	8S-9813	TP408	S-6-005	TC-25	684-.005	DT6D5	6K6 Plate Bypass
11	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	Audio Coupling
12	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	" "
13	.005	600	8S-9813	TP408	S-6-005	TC-25	684-.005	DT6D5	Tone Compensation
14	.005	600	8S-9813	TP408	S-6-005	TC-25	684-.005	DT6D5	" "
15	.005	600	8S-9813	TP408	S-6-005	TC-25	684-.005	DT6D5	Audio Coupling
16	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	Screen Bypass
17	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
18	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	" "
19	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	Osc. Plate Bypass
20	.05	400	8S9816-D	TP426	S-4-05	TC-15	484-.05	DT4S5	Cath. Coupling
21	500	500		MC245	M0.5-35	1FM-35	1468-.0005	5W5T5	Audio Coupling
22	500	500		MC245	M0.5-35	1FM-35	1468-.0005	5W5T5	RF Bypass Vol. Cont.
23	50	500		MC225	M0.5-45	1FM-45	1468-.00005	5W5Q5	Osc. Grid Cond.
24	50	500		MC225	M0.5-45	1FM-45	1468-.00005	5W5Q5	RF Coupling
25	1000	500		MC255	M0.3-21	1FM-21	1468-.001	1W5D1	Fixed Padder
26	535	500							Fixed Tuning

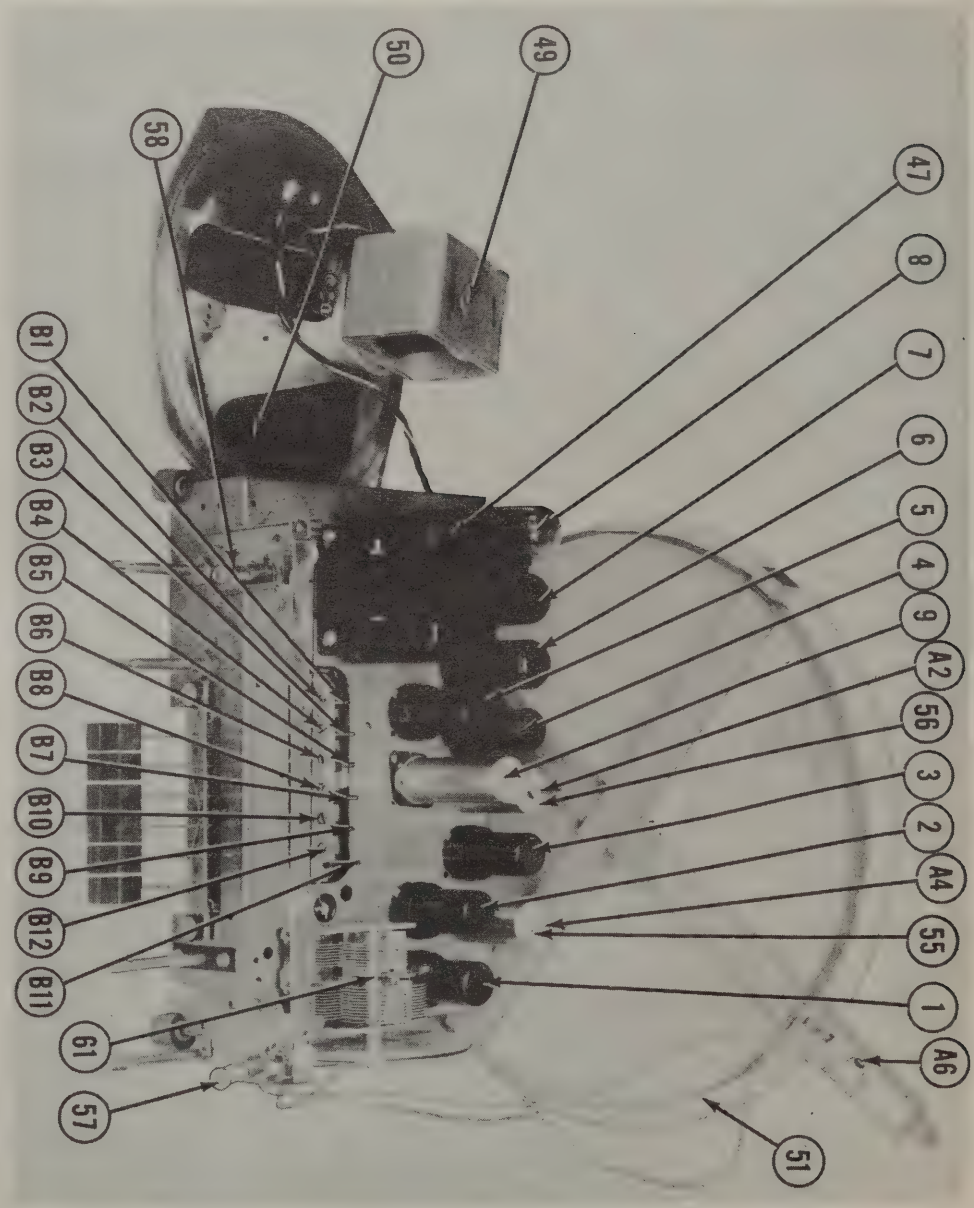
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
27A	1 Meg.	1	18A70068-B	TM240	D13-137X	AT-98	Volume Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 27A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
28A	1 Meg.	1	18K70087-B	UM160			Tone Control
B	Shaft		Not Req.	SS25			Attach to 28A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MOTOROLA PART No.	IRC PART No.	IDENTIFICATION CODES
29	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Ant. Loading
30	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Osc. Grid
31	470Ω	½		BTS-470	Yl.-Vi.-Br. Mixer Cathode
32	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. AVC Network
33	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. " "
34	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. " "
35	22KΩ	½		BTS-22K	Red-Red-Or. IF Screen Dropping
36	1000Ω	½		BTS-1000	Br.-Blk.-Red Osc. Plate Load
37	4.7 Meg.	½		BTS-4.7 Meg.	Yl.-Vi.-Grn. 1st AF Grid
38	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Diode Load
39	10Ω	½		BW-½-10	Br.-Blk.-Blk. Voltage Divider Bias
40	180Ω	1		BW-1-180	Br.-Gray-Br. Voltage Divider Bias
41	33KΩ	½		BTS-33K	Or.-Or.-Or. Tone Compensation
42	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
43	220KΩ	½		BTS-220K	Red-Red-Yl. Inverter Plate Load
44	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Power Amp. Grid
45	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. " " "
46	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Inverter Grid

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	MOTOROLA PART No.	STANCOR PART No.	THORDARSON PART No.	
47	117V @ .700A	640V CT @ .095A	5.0V @ 1.85A	6.3V @ 2.57A	25B26035	P-60131	T-13R131	†Use universal mounting brackets provided with this unit.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MOTOROLA PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
48	8375Ω	3Ω	580Ω CT	.42Ω	25B27661	A-2201	T-13S41‡		‡Drill one new mounting hole.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MOTOROLA PART No.	JENSEN PART No.		
49	FIELD RES. 800Ω	VC IMP. 3Ω	50B72379	ST-441*		*Change output transformer to match 6Ω voice coil. Parallel field coil with 2000Ω 20W resistor.
50	CONE DIA. 9-3/8"	VC DIA. 1"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	MOTOROLA PART No.	MEISSNER PART No.	
51	Loop Ant.	0Ω	1.4Ω	24K71287		
52	SW Ant.Coil	3Ω	0Ω		14-1044	
53	BC Osc. "		7Ω		14-1040	
54	SW " "		0Ω		14-1046	
55	Input IF	14Ω	14Ω		16-6658	Drill new mounting holes.
56	Output IF	15Ω	15Ω		16-6660	" " " "

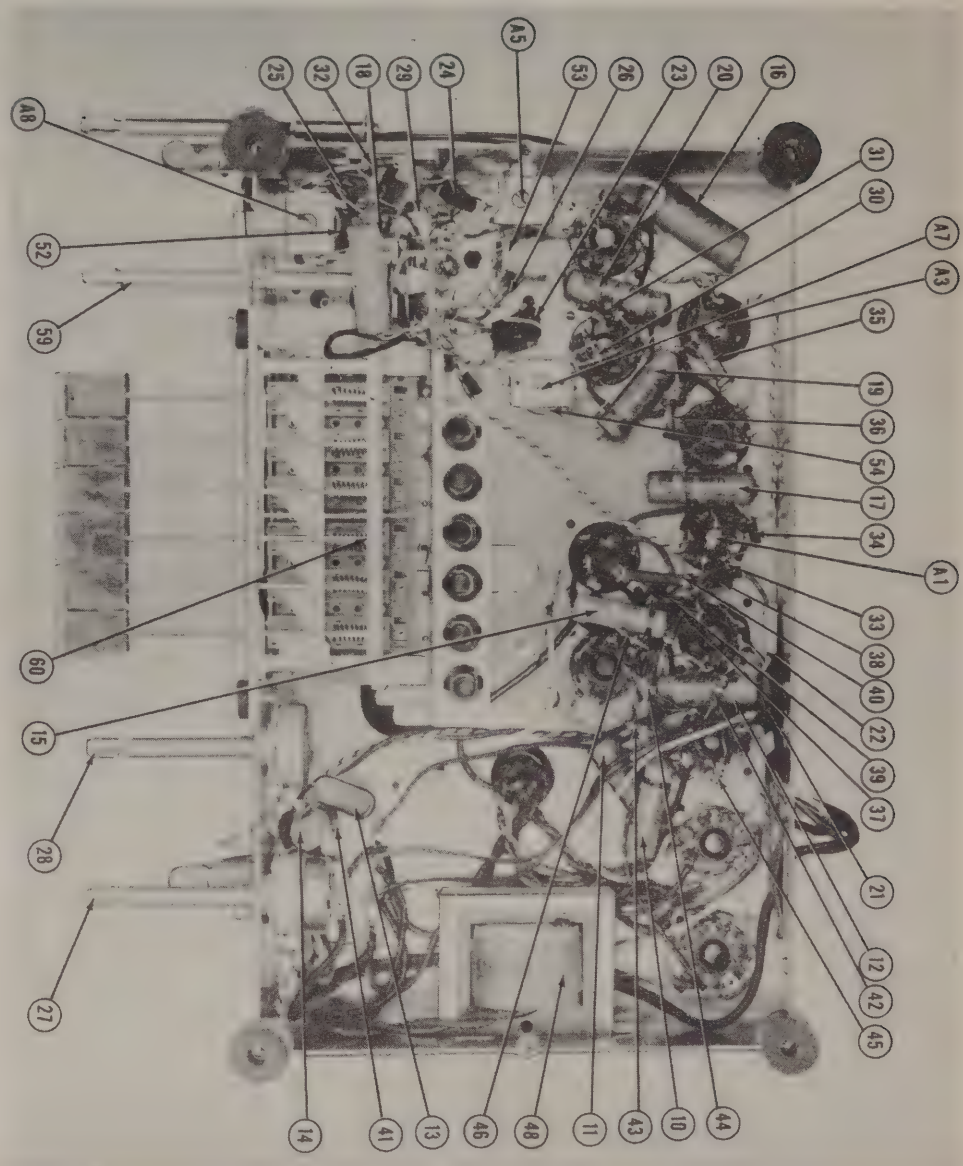
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MOTOROLA PART No.		
57	Bayonet	6-8	0.2	white			Type 51
58	"	6-8	0.2	"			" "

MISCELLANEOUS

ITEM No.	PART NAME	MOTOROLA PART No.	NOTES
59	Band Switch		
60	PB Assembly		Permeability Tuner
61	Tuning Cap.		2 Gang Variable Cap.

CHASSIS—BOTTOM VIEW



VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0V.	0V.	2.9V.DC	-.13V.DC	2.9V.DC	182V.DC	63V.AC	207V.DC
2	6J5	0V.	0V.	211V.DC	0V.	-.25V.DC	0V.	6.3V.AC	0V.
3	6SG7	0V.	0V.	0V.	-.34V.DC	0V.	182V.	6.3V.AC	225V.DC
4	6SQ7	0V.	-1.2V.DC	-.9V.DC	-1.03V.DC	-1.03V.DC	100V.DC	6.3V.AC	0V.
5	6SQ7	0V.	-18V.	-17.4V.DC	*	*	68V.DC	6.3V.AC	0V.
6	6K6GT	0V.	0V.	220V.DC	227V.DC	-12V.DC	0V.	6.3V.AC	0V.
7	6K6GT	0V.	0V.	220V.DC	227V.DC	-12V.DC	-18V.DC	6.3V.AC	0V.
8	5Y3GT	0V.	300V.DC	0V.	320V.AC	0V.	320V.AC	0V.	300V.DC

* NO CONNECTION. "FREE" DIODES AT CATHODE POTENTIAL

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SG7	0Ω	0Ω	480Ω	2.9MEG	480Ω	300KΩ	0Ω	280KΩ
2	6J5	0Ω	0Ω	280KΩ	INF	40KΩ	INF	0Ω	1Ω
3	6SG7	0Ω	0Ω	0Ω	2.5MEG	0Ω	300KΩ	0Ω	280KΩ
4	6SQ7	0Ω	4MEG	9Ω	380KΩ	380KΩ	500KΩ	0Ω	0Ω
5	6SQ7	0Ω	85KΩ	185Ω	INF *	INF *	500KΩ	0Ω	0Ω
6	6K6GT	0Ω	0Ω	280KΩ	280KΩ	580KΩ	INF	0Ω	0Ω
7	6K6GT	0Ω	0Ω	280KΩ	280KΩ	590KΩ	85KΩ	0Ω	0Ω
8	5Y3GT	INF	280KΩ	INF	350Ω	INF	350Ω	INF	280KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

DIAL CORD DRIVE

PUSHBUTTON ADJUSTMENTS

The six pushbuttons from left to right (facing front of receiver) cover the following frequency ranges: 540 to 930KC, 600 to 1050KC, 650 to 1200KC, 650 to 1200KC, 750 to 1350KC, 900 to 1600KC. To set up the pushbuttons proceed as follows:

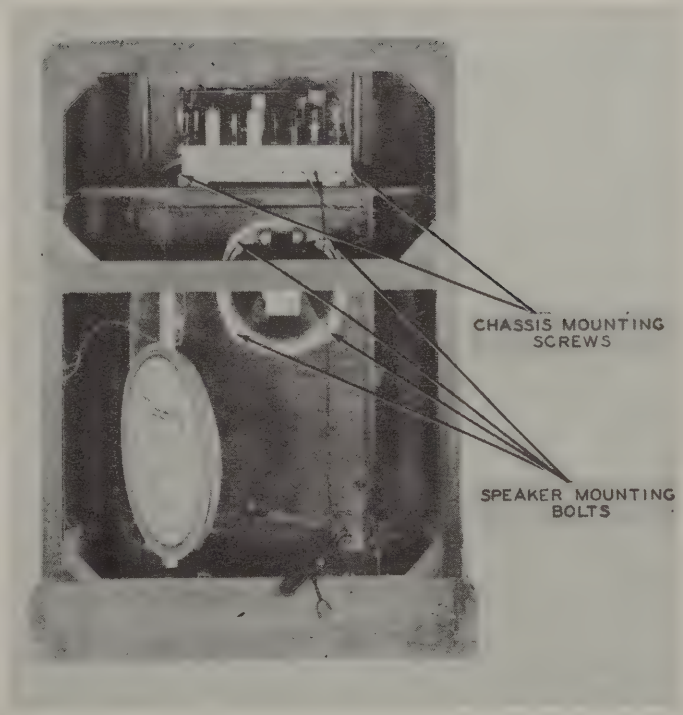
1 - Turn band switch to BC (broadcast) position. Turn radio on and allow for warm up time.

2 - Select a station within the frequency range of the pushbutton to the extreme left and associated adjustments B1, B2 (540 to 930KC). Tune in station by manual tuning and listen to program so you may identify it.

3 - Turn band switch to pushbutton position. Push in button to extreme left. Adjust B1 to tune in station selected.

4 - Adjust B2 for maximum volume of station.

5 - Proceed in the same manner to set up remaining pushbuttons. Always select a station within range of pushbutton and associated adjustments. B3, B5, B7, B9 and B11 are adjusted to tune in station. B4, B6, B8, B10 and B12 are adjusted for maximum volume.



DISASSEMBLY INSTRUCTIONS

1 - Remove band switch, volume, tone, and tuning control push-on knobs from front panel.

2 - Remove two Phillips head screws, holding dial glass panel to cabinet.

3 - Tilt dial glass forward and remove by raising upward.

4 - Remove dial pointer from slot by pulling forward.

5 - Remove screw holding speaker plug in socket and remove plug.

6 - Remove antenna plug from chassis socket.

7 - Remove red and white antenna loop lead from cabinet clip.

8 - Remove white lead from antenna loop connecting to chassis.

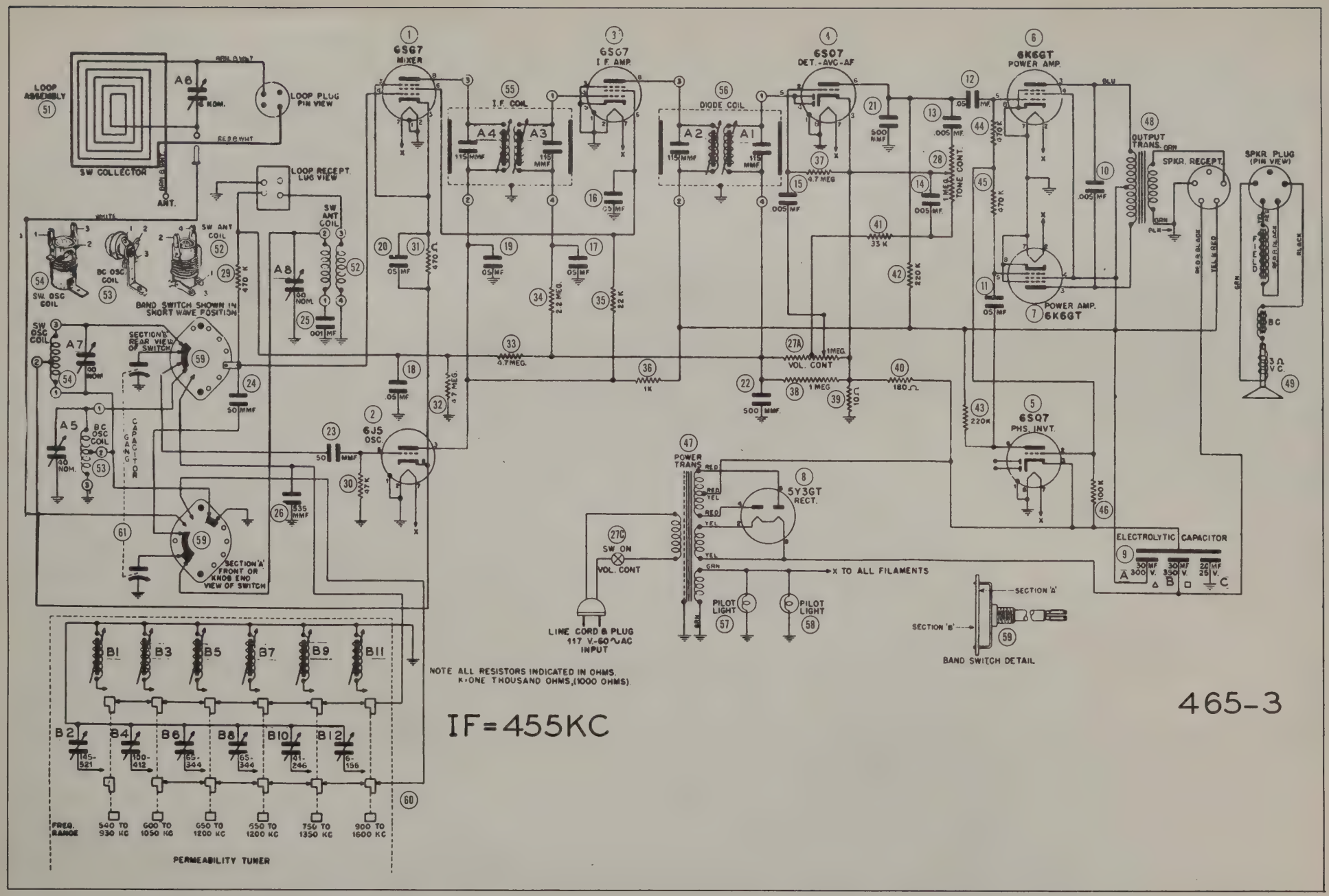
9 - Remove phono plug and pickup jack.

10- Remove clip holding phono cord to phono mounting board.

11- Remove four bolts holding chassis to mounting board and remove chassis.

12--Remove four nuts and washers holding speaker to baffle board, and remove speaker.

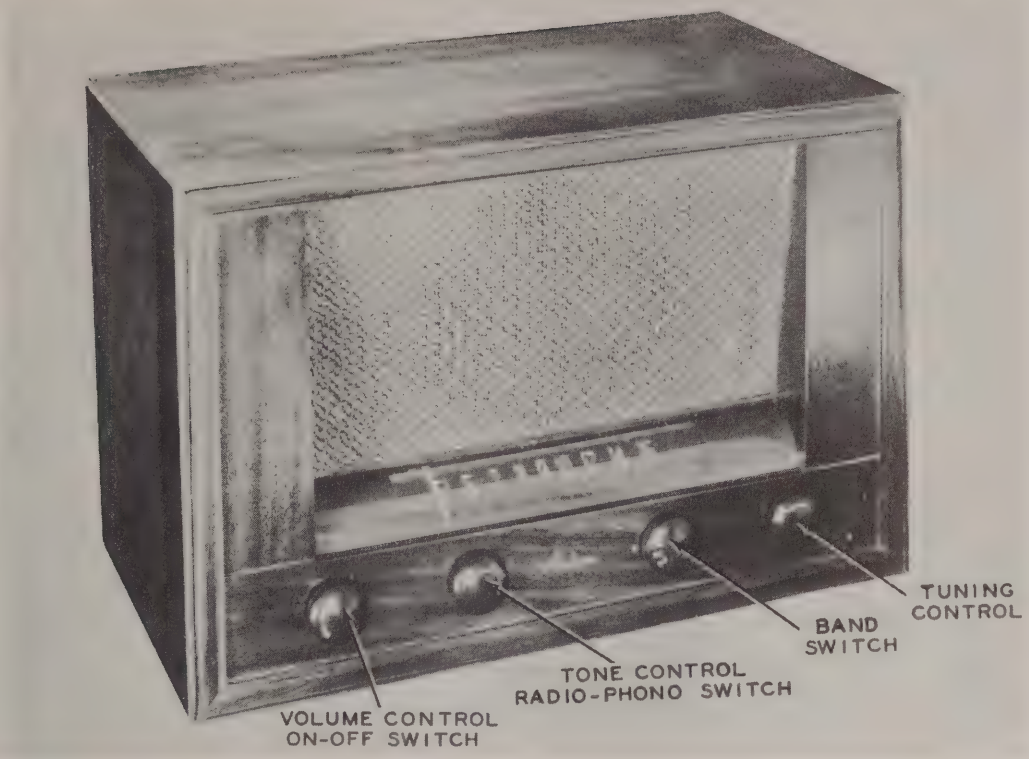
13- Force antenna loop mounting brackets apart and remove loop.



Reference stage gain measurements are not included at the request of the manufacturer.

1. DC Voltage measurements are at 20,000 ohms per volt; AC voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRLINE
MODELS 64WG-1807A, 64WG-1807B



AIRLINE
MODELS 64WG-1807A, 64WG-1807B

AIRLINE MODEL 64WG-1807A

TRADE NAME	Airline Models 64WG-1807A, 64WG-1807B
MANUFACTURER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC 2 Band Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 6SA7 Mixer, 6SK7 1st IF Amp., 6SF7 2nd IF-Det.-AVC, 6SJ7 1st AF Amp., 6V6GT Power Output, 6X5GT Rectifier
POWER SUPPLY	105-125 Volts AC — RATING .360 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1600KC — **SHORT WAVE** 9-15.6 MC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #8 (grid) of 6SA7. Low side to chassis.	455KC	BC B Range	Turn rotor to full open	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
100 MMFD	High side to ant. lead. Low side to chassis.	1620KC	"	"	"	A5	" " " "
"	"	1400KC	"	Tune in 1400 KC signal. Set pointer to 1400KC	"	A6	" " " "
"	"	600KC	"	Tune in 600 KC signal.	"	A7	Rock rotor and adjust for maximum output. Repeat adjustments A5 at 1620KC and A7 at 600KC until no improvement can be obtained by adjusting A5.
400Ω res.	"	15.6MC	SW D Range	Turn rotor to full open	"	A8	Adjust for maximum output
"	"	14MC	"	Tune in 14MC signal.	"	A9	Rock rotor and adjust for maximum output.
100 MMFD	"	1400KC	BC B Range	Tune in 1400 KC signal.	"	A6	Adjust for maximum output. Have chassis reassembled in cabinet.

HOWARD W. SAMS & CO., INC. • 2924 East Washington Street • Indianapolis 6, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Mixer	6SA7	6SA7	8R	
2	1st IF Amp.	6SK7	6SK7	8N	
3	2nd IF-Det.-AVC	6SF7	6SF7	7AZ	
4	1st AF Amp.	6SJ7	6SJ7	8N	
5	Power Output	6V6GT	6V6GT	7AC	
6	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	450	45X346	FP346	DY-2x40-450/20-25	EL-330		UP9DJ53	● Filter
B	40	450							■ "
C	20	25							▲ Cath. Bypass
8	.004	400	D66402	TP407	S-6-004	TC-24	484-.004	DT6D4	6V6 Plate Bypass
9	.01	400	D66103	TP421	S-4-01	TC-11	484-.01	DT4S1	Audio Coupling
10	.004	400	D66402	TP407	S-6-004	TC-24	484-.004	DT6D4	Tone Compensation
11	.025	400	D64253	TP451			484-.025	DT4S25	Audio Plate Decoup.
12	.1	400	D66104	TP428	S-4-1	TC-1	484-.1	DT4P1	Audio Screen Bypass
13	.005	400	D66502	TP408	S-6-005	TC-25	484-.005	DT6D5	Audio Coupling
14	.04	400	D66403	TP425	S-6-04	TC-14	484-.04	DT4S4	Tone Compensation
15	.04	400	D66403	TP425	S-6-04	TC-14	484-.04	DT4S4	Screen Bypass
16	.05	200	B66503	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
17	.04	400	D66403	TP425	S-6-04	TC-14	484-.04	DT4S4	6SA7 Screen Bypass
18	.0005	200	B66501	TP403	S-6-0005	TC-35	1468-.0005	DT6T5	RF Coupling
19	330	500	47X470	MC241	MO.5-33	1FM-335	1468-.0003	5W5T3	Audio Plate Bypass
20	47	500	47X463	MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	Tone Compensation
21	68	500	47X471			MS-47	1469-.00007	5W5Q7	IF Filter Diode
22	100	500	47X476	MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	" " "
23	47	500	47X463	MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	IF Coupling
24	68	500	47X466			MS-47	1469-.00007	5W5Q7	Osc. Grid Capacitor
25	286	500	47X481						Fixed Padder
26	40	500	47X472	MCB223	MOS.5-44	MS-44	1469-.00004	5R5Q4	Fixed Trimmer
27	360	500	47X474						Fixed Padder
28	47	500	47X473	MCB225	MOS.5-45	MS-45	1469-.00005	5R5Q5	Fixed Trimmer
29	270	500	47X445	MC241	MO.5-33	MS-33	1468-.0003	5W5T3	Loop Pri. Shunt
64	.2	400	D67204	TP429	S-4-2	TC-2	484-.2	5W5P2	RF Bypass Pwr. Supp.*

* Used in series B models.

CONTROLS

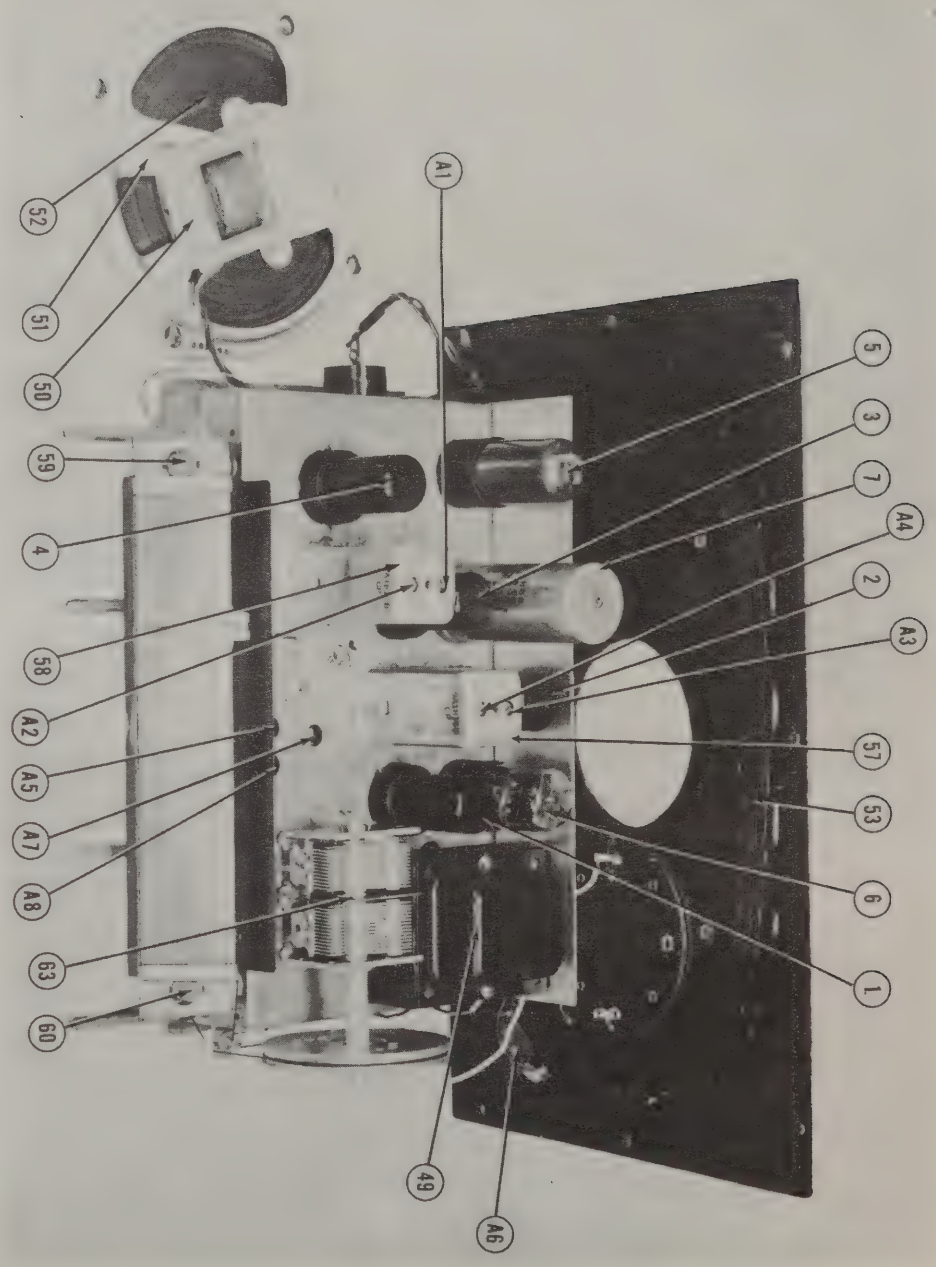
TEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
30A	500KΩ	1	36X354	TM227	D13-133X	AT-92‡	Volume Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 30A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
31A	3 Meg.	1	40X280	UM165	D13-140	AM-67-Z	Tone Control-See Note 1
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 31A per instructions
31A	3 Meg.	1	40X275				
B	Shaft		Not Req.				

‡Use 100KΩ tap, cut other tap off.
Note 1 - Attach original arm to tone control shaft to actuate radio-phono switch.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
32	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. Converter Grid
33	39KΩ	1	C84393	BTA-39K	Or.-White-Or. Mixer Screen Dropping
34	39KΩ	½	B84393	BTS-39K	Or.-White-Or. Osc. Grid
35	39KΩ	1	C84393	BTA-39K	Or.-White-Or. IF Screen Dropping
36	2200Ω	½	B84222	BTS-2200	Red-Red-Red IF Plate Load
37	1 Meg.	½	B84105	BTS-1 Meg.	Br.-Blk.-Grn. IF Grid
38	2.2 Meg.	½	B85225	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
39	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. IF Filter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONTINUED)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
40	15KΩ	½	B84153	BTS-15K	Br.-Grn.-Or. Tone Compensation
41	10 Meg.	½	B85106	BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
42	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. 1st AF Screen Dropping
43	33KΩ	½	B84333	BTS-33K	Or.-Or.-Or. 1st AF Plate Load
44	82KΩ	½	B84823	BTS-82K	Gray-Red-Or. 1st AF Plate Filter
45	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
46	270Ω	1	C84271	BW-1-270	Red-Vi.-Br. Output Cathode
47	2Ω	½	43X213	BW-½-2.2	Series Pilot Lights
48	1800Ω	2	D84182	BT-2-1800	Br.-Gray-Red Filter

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	AIRLINE PART No.	STANCOR PART No.	THORDARSON PART No.	
49A	117V AC @ .360A	485V CT @ .060A	6.35VAC @ 2.5A		53X282			60 Cycle
B	117VAC				53X283			25 Cycle
C	117-234V				53X284			40-60 Cycle

Items 49A & 49B are standard power transformers. 49C is a universal type.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
50A	7000Ω	3.5Ω	450Ω	.7Ω	51X97	A-3823	T-14S85		
B	6300Ω	3.4Ω	440Ω	.7Ω	51X97A	A-3823	T-14S85		Used as substitute part.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	VC IMP.	AIRLINE PART No.	JENSEN PART No.		
51A	PM	3.5Ω	12A435	ST-109		
B	PM	3.4Ω	12A461	ST-109		Used as substitute part
	CONE DIA.	VC DIA.				
52A	6"	11/16"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			
B	6"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

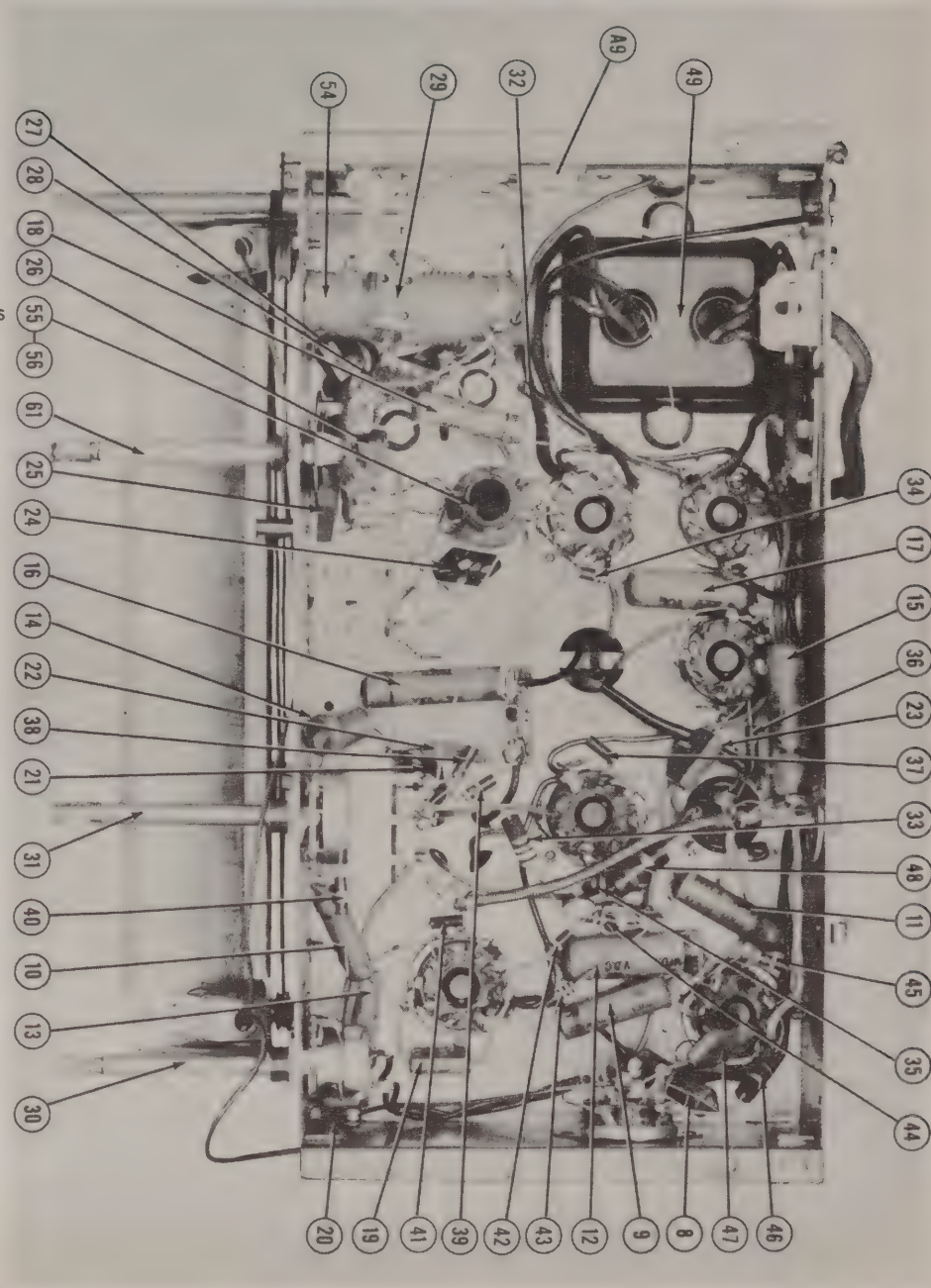
R F COILS

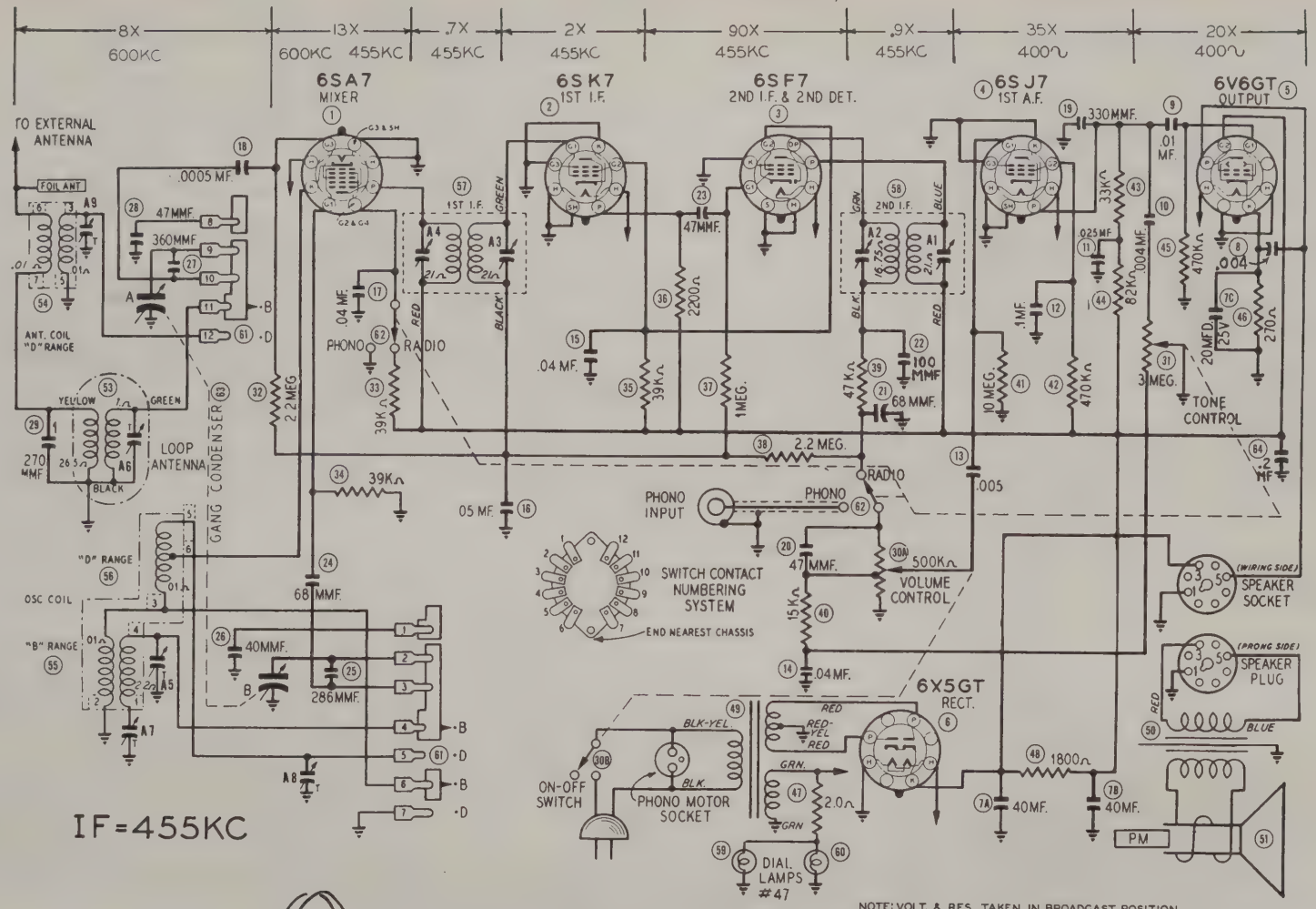
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
53	"B" LoopAnt	25Ω	.5Ω	9A1791		
54	"D" Ant.Coil	1Ω	0Ω	9A1812		
55	"B" Osc. "	1Ω	2Ω	9A1813		Items 55, 56 wound on same form.
56	"D" " "		0Ω	9A1813		
57	Input IF	22Ω	20.5Ω	9A1814	16-3658	
58	Output IF	19.8Ω	18.2Ω	9A1815	16-6660	

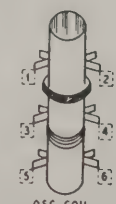
MISCELLANEOUS

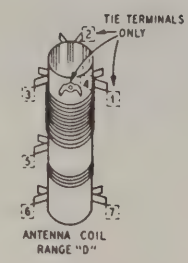
ITEM No.	PART NAME	PART No.	NOTES
59	Dial Light		Type 47 Brown Bead
60	Dial Light		" " " "
61	Band Switch	2A345	
62	Switch	2A161	Radio-Phono(When 40X280 is used)
63	Tuning Cap.	14A178	2 Gang Var. Cap. with Drive Pulley
A5	Trimmer }	17A109	BC Osc. Adj. 2.5-35 MMF
A8	Trimmer }		SW " " " "
A6	Trimmer	17A123	BC Ant. Adj. 1-12 MMF
A7	Padder	17A155	BC Osc. Pad 350-430 MMF
A9	Trimmer	17A164	SW Ant. Adj. 5-50 MMF
	Switch Lever	25X1539	Radio-Phono(When 40X280 is used)

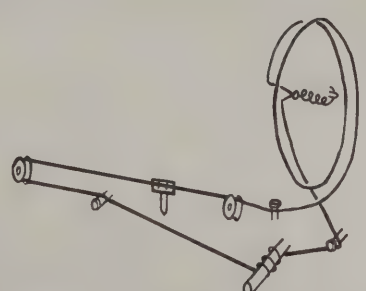
CHASSIS—BOTTOM VIEW











NOTE: VOLT. & RES. TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0V.	0V.	202V.DC	50V.DC	-3V.DC	0V.	6.35V.AC	0V.
2	6SK7	0V.	0V.	0V.	-3V.DC	0V.	57V.DC	6.35V.AC	190V.DC
3	6SF7	0V.	-4V.DC	0V.	57V.DC	-.25V.DC	205V.DC	6.35V.AC	0V.
4	6SJ7	0V.	0V.	0V.	-.25V.DC	0V.	36V.DC	6.35V.AC	37V.DC
5	6V6GT	0V.	6.35V.AC	245V.DC	200V.DC	0V.	0V.	0V.	98V.DC
6	6X5GT	0V.	0V.	240V.AC	0V.	240V.AC	0V.	6.35V.AC	260V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7	0Ω	0Ω	677KΩ	716KΩ	39KΩ	1Ω	.25Ω	42MEG
2	6SK7	0Ω	0Ω	0Ω	27MEG	0Ω	716KΩ	.25Ω	679KΩ
3	6SF7	0Ω	3.6MEG	0Ω	716KΩ	430KΩ	677KΩ	.25Ω	0Ω
4	6SJ7	0Ω	0Ω	0Ω	8MEG	0Ω	1.2MEG	.25Ω	792KΩ
5	6V6GT	0Ω	.25Ω	675KΩ	677KΩ	450KΩ	1 NF.	0Ω	250Ω
6	6X5GT	1 NF.	0Ω	195Ω	1 NF.	182Ω	1 NF.	.25Ω	675KΩ

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

465-4

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

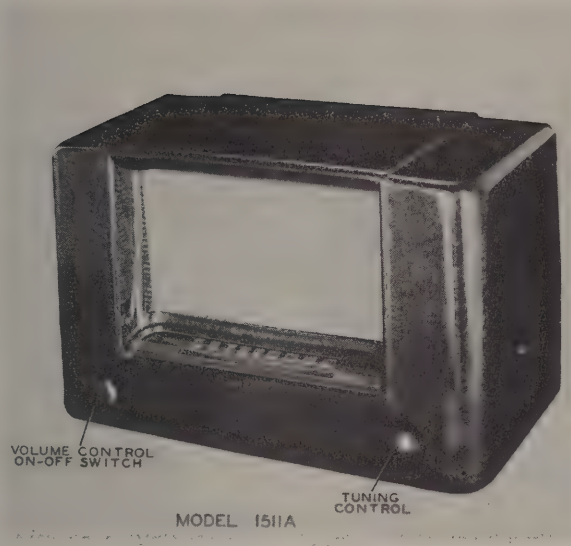
1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

PHOTOFACT* Folder

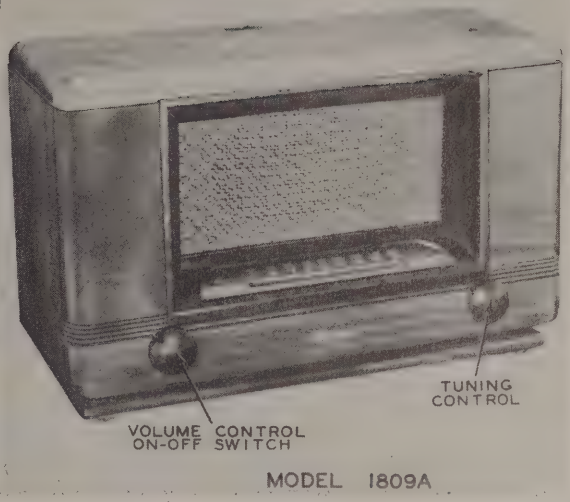
*TRADE MARK

AIRLINE
MODELS 64WG-1511A, B; 64WG-1512A, B; 64WG-1809A, B

AIRLINE
MODELS 64WG-1511A, B;
64WG-1512A, B; 64WG-1809A, B



MODEL 1511A



MODEL 1809A

AIRLINE
MODELS 64WG-1511A, B;
64WG-1512A, B; 64WG-1809A, B

AIRLINE MODEL 64WG-1511A

TRADE NAME	Airline Models 64WG-1511A, B: 64WG-1512A, B: 64WG-1809A, B.
MANUFACTURER	Montgomery Ward & Co., 319 Chicago Ave., Chicago, Ill.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types 12SK7 RF Amp., 12SA7 Converter, 12SF7 IF-Det.-AVC, 12SJ7 1st AF Amp., 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING .230 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS

Check dial pointer position as shown on dial diagram. Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #2 (grid) 12SF7. Low side to B-.	455KC	1600KC	Across voice coil.	A1,A2.	Adjust for maximum output. Use isolation transformer if available. If not, connect capacitor in series with low side to B-. and decrease dummy ant. to .001 MFD to prevent excessive hum modulation.
"	High side to pin #8 (grid) 12SA7. Low side to B-.	"	"	"	A3,A4.	"
"	"	1400KC	1400KC index line.	"	A5	"
50 MMFD	High side to ext. ant. clip on loop frame. Low side to chassis.	"	"	"	A6,A7	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: AIRLINE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SK7	12SK7	8N	
2	Converter	12SA7	12SA7	8R	
3	IF-Det.-AVC	12SF7	12SF7	7AZ	
4	1st AF Amp.	12SJ7	12SJ7	8N	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AIRLINE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	50	150	45X344	UN521	DHN-2x50-150	TA-530	PRS150-40-40	EZ5515	Filter - Red
B	50	150							" - Green
C	20	25		TC26	M-25-25	TA-25	PRS25-25	BR202A	" - Yellow
8	.1	400	D63104	TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
9	.2	200	D67204	TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating
10	.01	200	B63103	TP421	S-4-01	TC-11	484-.01	DT4S1	35L6 Plate Bypass
11	.025	200	B64253	TP451	S-4-02	TC-12	484-.025	DT4S25	Audio Plate Decoup.
12	.01	200	B66103	TP421	S-4-01	TC-11	484-.01	DT4S1	Audio Coupling
13	.1	200	B66104	TP428	S-4-1	TC-1	484-.1	DT4P1	Audio Screen Bypass
14	.006	200	B66602	TP409	S-6-006	TC-26	484-.006	DT6D6	Audio Coupling
15	.04	200	B64403	TP425	S-4-04	TC-14	484-.04	DT4S4	Tone Compensation
16	.05	200	B66503	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
17	.001	200	B66102	TP404	S-6-001	TC-21	484-.001	DT6D1	RF Bypass
18	.001	200	B66102	TP404	S-6-001	TC-21	484-.001	DT6D1	RF Coupling
19	.001	200	B66102	TP404	S-6-001	TC-21	484-.001	DT6D1	AVC Filter
20	.001	400	D66102	TP404	S-6-001	TC-21	484-.001	DT6D1	Ant. Coupling
21	.05	200	B67503	TP426	S-4-05	TC-15	484-.05	DT4S5	12SA7 Screen Bypass*
22	470	500	47X467	MC245	MO.5-35	1FM-35	1468-.0005	5W5T5	Audio Plate Bypass
23	100	500	47X476	MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	IF Bypass Diode
24	47	500	47X463	MC225	MO.5-45	1FM-31	1468-.00005	5W5Q5	Tone Compensation
25	47	500	47X446	MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	Osc. Grid Capacitor

*Used in series B models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
26A	500KΩ	1	36X347	TM230	D13-133X	AT-92‡	Volume Control
B	Shaft		Not Req.	SS25	E	KSS-3	Attach to 26A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

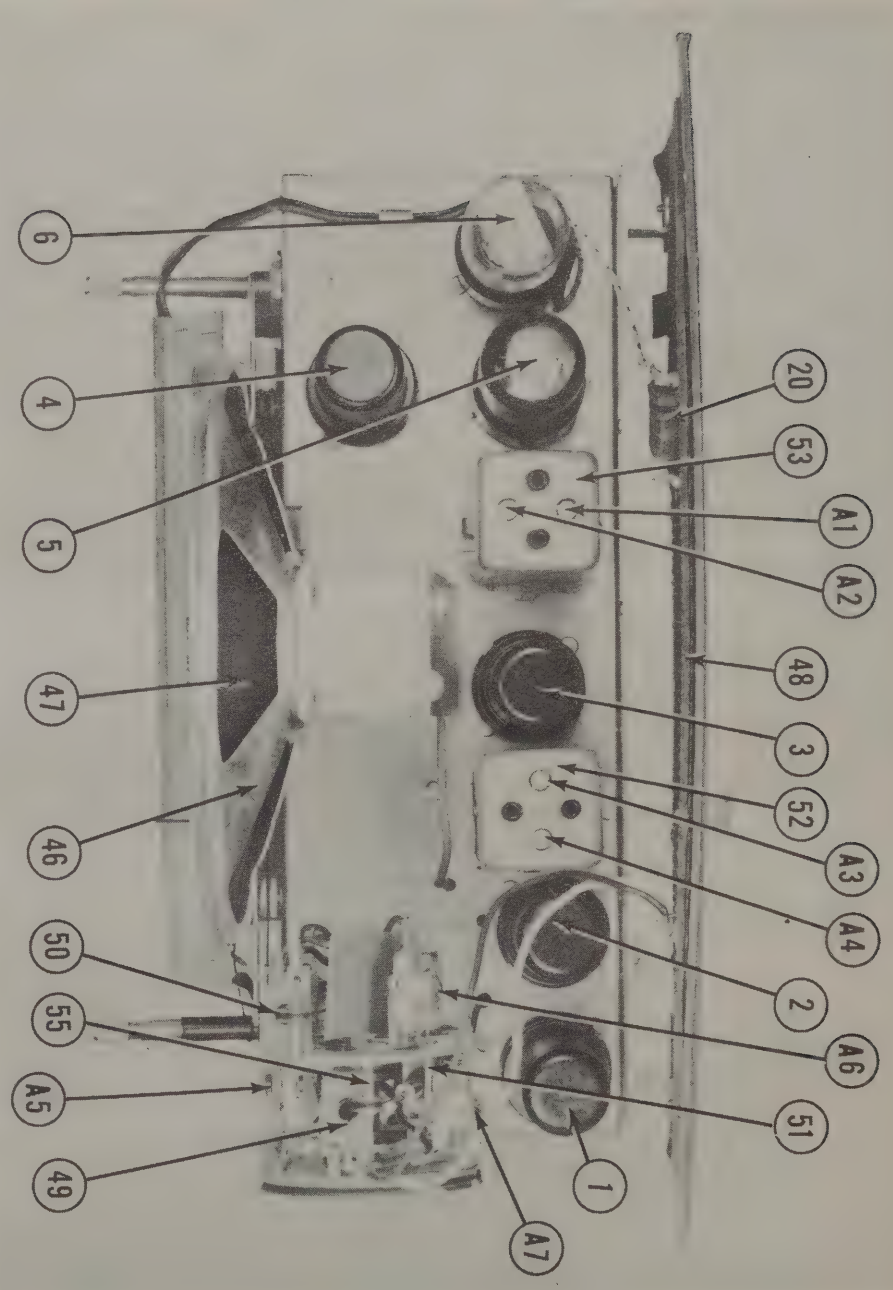
‡ Use 100KΩ tap. Cut other tap off.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AIRLINE PART No.	IRC PART No.	IDENTIFICATION CODES
27	220KΩ	½	B85224	BTS-220K	Red-Red-Yl. AVC Network
28	15KΩ	½	B84153	BTS-15K	Br.-Grn.-Or. RF Screen Dropping
29	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Converter Grid
30	39KΩ	½	B84393	BTS-39K	Or.-White-Or. Osc. Grid
31	2.2 Meg.	½	B85225	BTS-2.2 Meg	Red-Red-Grn. AVC Network
32	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. IF Filter
33	15KΩ	½	B84153	BTS-15K	Br.-Grn.-Or. Tone Compensation
34	4.7 Meg.	½	B85475	BTS-4.7 Meg	Yl.-Vi.-Grn. 1st AF Grid
35	33KΩ	½	B84333	BTS-33K	Or.-Or.-Or. 1st AF Plate Load
36	470KΩ	½	B84474	BTS-470K	Yl.-Vi.-Yl. 1st AF Screen Dropping
37	82KΩ	½	B84823	BTS-82K	Gray-Red-Or. 1st AF Plate Filter
38	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
39	180Ω	½	B83181	BW-½-180	Br.-Gray-Br. Output Cathode
40	1500Ω	1	C84152	BTA-1500	Br.-Grn.-Red Filter
41	27Ω	½	B84270	BW-½-27	Red-Vi.-Blk. Rectifier Ballast
42	39Ω	2	D84390	BW-2-39	Or.-White-Blk. Filament Dropping
43	270KΩ	½	B84274	BTS-270K	Red-Vi.-Yl. Line Isolating
44	470Ω	½	B85471	BTS-470	Yl.-Vi.-Br. Filter *

*Used in series B models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
45	3000Ω	4Ω	350Ω	.85Ω	51X116	A-3876†	T-13S39††		†Drill new mounting holes. ††Mount vertically instead of horizontally beneath chassis.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA AIRLINE PART No.	JENSEN PART No.		INSTALLATION NOTES
46	FIELD PM	VC IMP. 4Ω	12A431			
47	CONE DIA. 4x6"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA AIRLINE PART No.	MEISSNER PART No.	INSTALLATION NOTES
48A	Loop Ant.	0Ω	.4Ω	9A1803		Ivory Plastic Cabinet
B	" "			9A1773		Walnut " "
C	" "			9A1863		Walnut Wood Cabinet
49	Ant. Coil	.5Ω	8Ω			Items 49, 50, 51 ganged & slug tuned
50	RF Coil	8.3Ω				
51	Osc.Coil	.7Ω	6Ω			
52	Input IF	22Ω	22Ω	9A1775	16-6658	
53	Output IF	21.8Ω	18.3Ω	9AI776	16-6660	

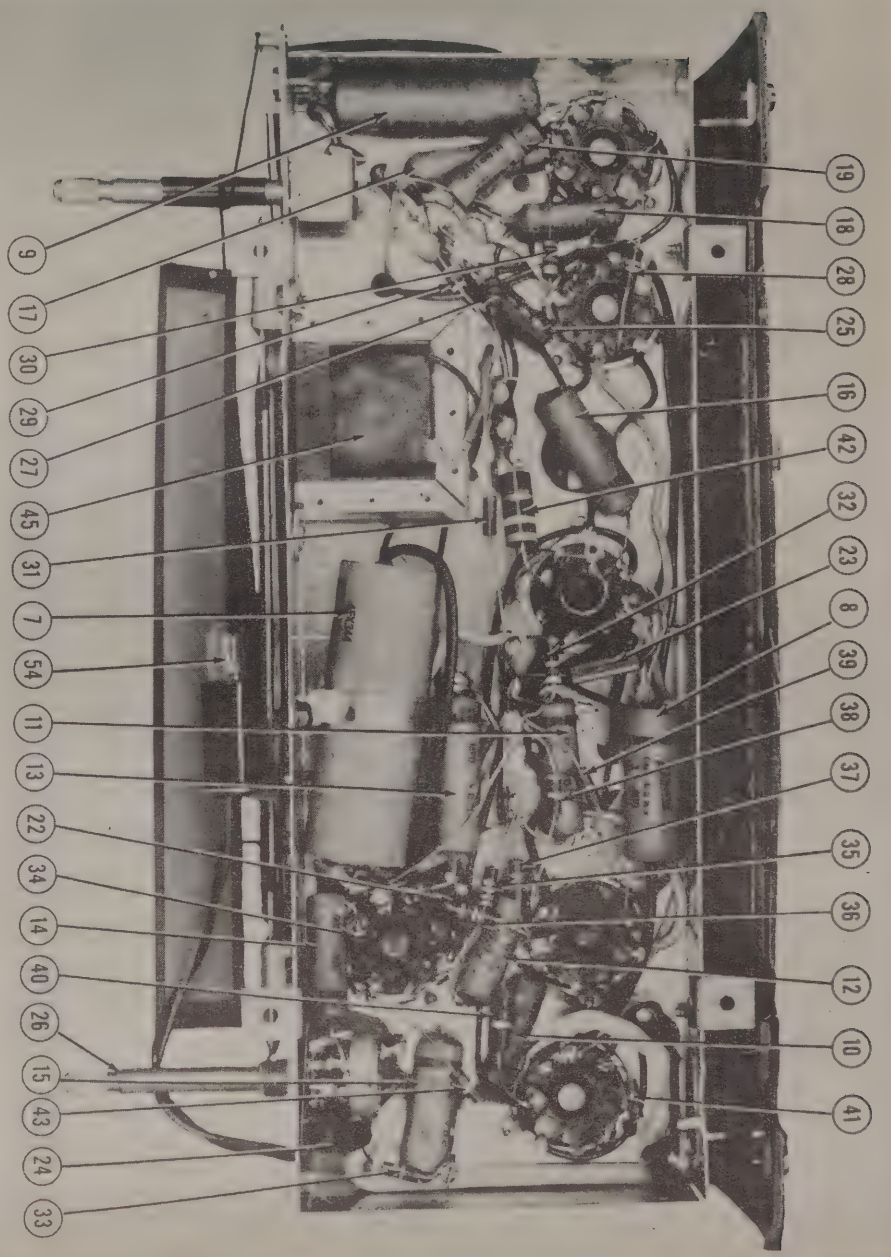
DIAL LIGHT

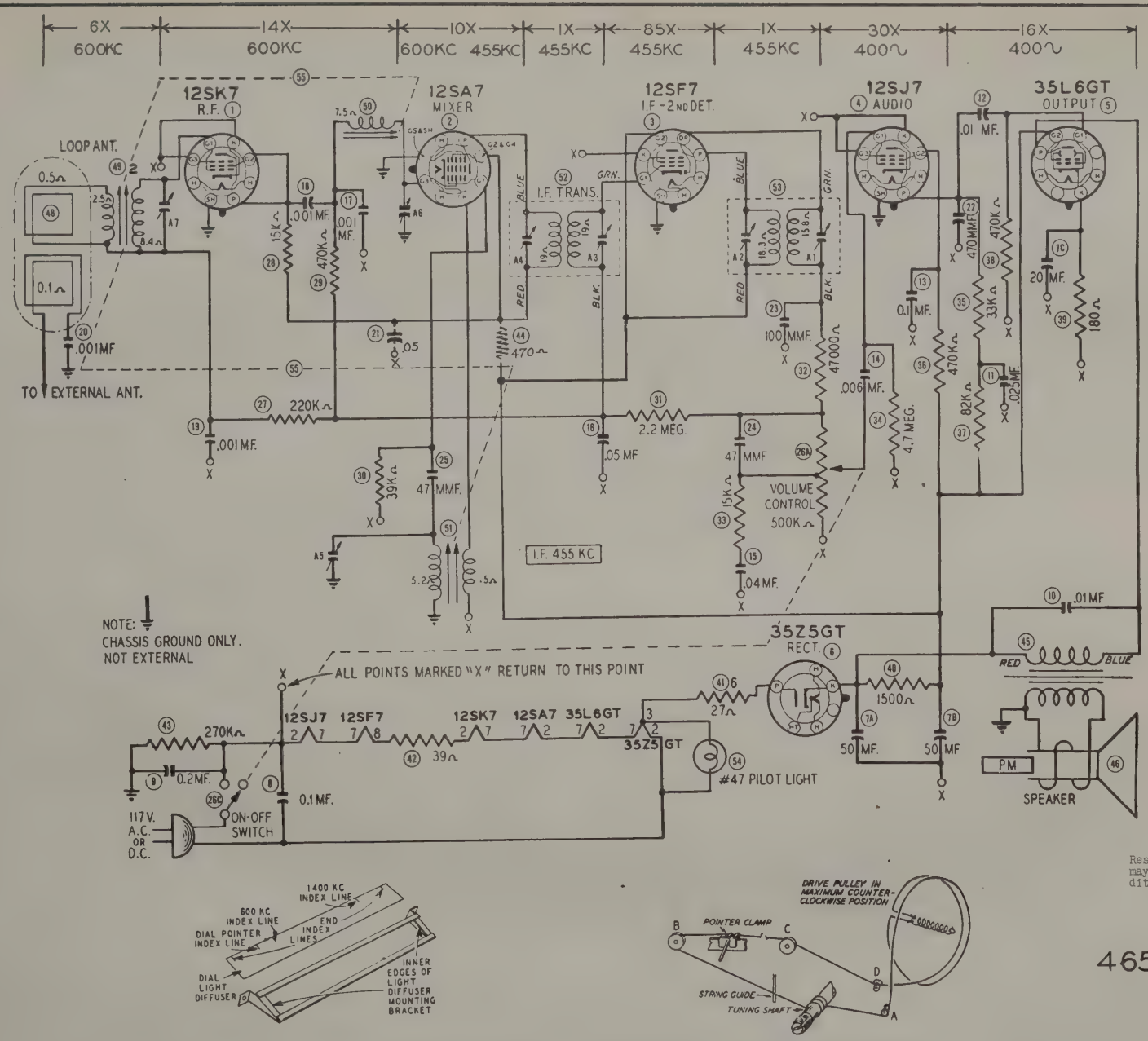
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA AIRLINE PART No.		INSTALLATION NOTES
54	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
55	Tuning Assby.	20A97	Complete with Coils & Trimmers
A5	Trimmer	17A239	Osc. Adj. 40-370 MMF
A6	"	17A243	RF Adj. 4-70 MMF
A7	"	17A238	Ant. Adj. 4-70 MMF
	Knob	10A297	Vol.-On-Off Switch; Tuning (Walnut)
	"	10A300	Vol.-On-Off Switch; Tuning (Ivory)
	Cabinet	55X249	Ivory Plastic
	"	55X264	Walnut "
	Pointer	15X217	
	Dial	58A645	Ivory Plastic Cabinet
	"	58X696	Walnut " "
	"	58X650	" Wood "

CHASSIS—BOTTOM VIEW





Pin No	12SK7 Volt	12SK7 Res	12SA7 Volt	12SA7 Res
1	0 V	290K Ω	0 V	290K Ω
2	31.8 VAC	62 Ω	57 V AC	82 Ω
3	0 V	0 Ω	82 V DC	50K Ω
4	-6 V DC	2.5 MEG	82 V DC	50K Ω
5	0 V.	0 Ω	-4 V DC	39K Ω
6	34 V DC	65K Ω	0 V	.5 Ω
7	43.6 V AC	72 Ω	43.6 V AC	72 Ω
8	34 V DC	65K Ω	-.05 V DC	2.8 MEG

Pin No.	12SF7 Volt	12SF7 Res	12SJ7 Volt	12SJ7 Res
1	0 V.	290K Ω	0 V.	290K Ω
2	-35 V DC	2.3 MEG	0 V	0 Ω
3	0 V.	0 Ω	0 V.	0 Ω
4	82 V DC	50K Ω	-45 V DC	3.9 MEG
5	-35 V DC	430K Ω	0 V.	0 Ω
6	82 V DC	50K Ω	20 V DC	520K Ω
7	12.8 V AC	12 Ω	12.8 V AC	12 Ω
8	25.8 V AC	24.5 Ω	23.5 V DC	165K Ω

Pin No	35L6GT Volt	35L6GT Res	35Z5GT Volt	35Z5GT Res
1	0 V	1 NF	0 V.	1 NF
2	88 V. AC	108 Ω	117 V AC	135 Ω
3	109 V DC	50K Ω	113 V AC	132 Ω
4	82 V DC	50K Ω	0 V	1 NF
5	0 V.	470K Ω	112 V AC	160 Ω
6	0 V	1 NF	0 V.	1 NF
7	57 V. AC	82 Ω	88 V. AC	108 Ω
8	5.4 V DC	179 Ω	118 V DC	50K Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

1400 KC INDEX LINE
600 KC INDEX LINE
DIAL POINTER INDEX LINE
END INDEX LINES
DIAL LIGHT DIFFUSER
INNER EDGES OF LIGHT DIFFUSER MOUNTING BRACKET

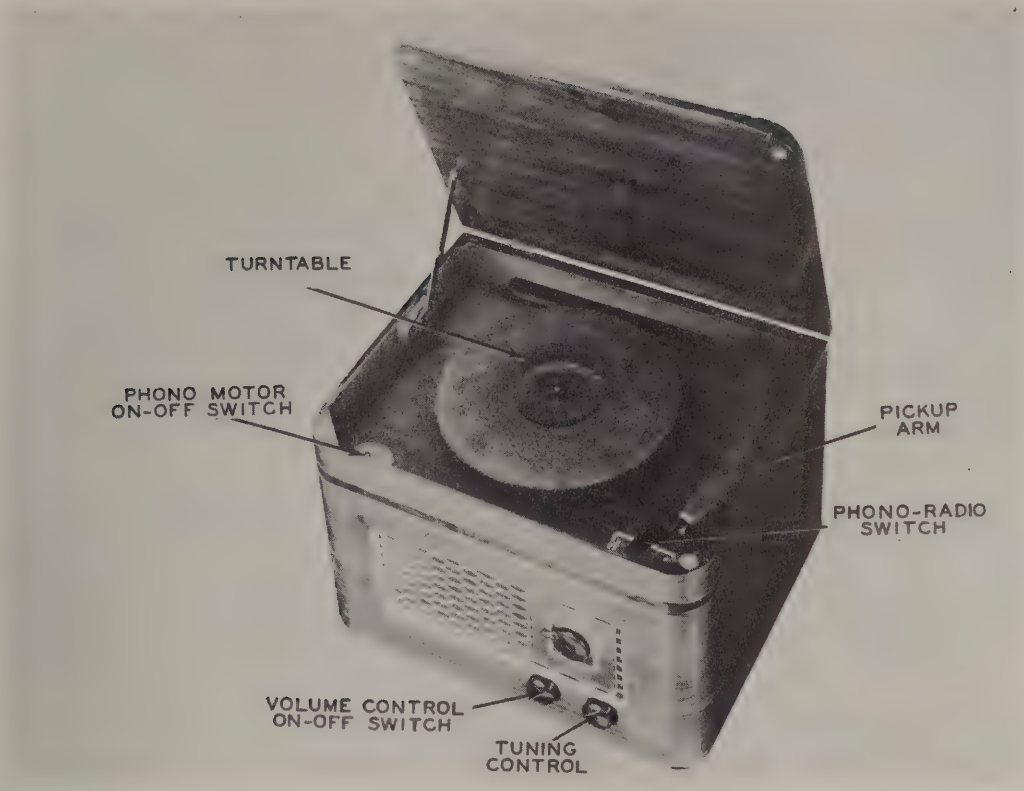
465-5

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

AIRLINE
MODELS 64WG-2007A, 64WG-2007B



AIRLINE MODEL 64WG-2007B

TRADE NAME	Airline Models 64WG-2007A, 64WG-2007B
MANUFACTURER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Ill.
TYPE SET	AC Operated Combination Phono-Superheterodyne Receiver-Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC RATING .240 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #4 (grid) 12SK7. Low side to B-.	455KC	Turn rotor full open.	Across voice coil	A1,A2.	Adjust for maximum output. Use isolation transformer if available. If not connect capacitor in series with low lead to B- and decrease dummy ant. to .001 MFD to prevent excessive hum modulation.
"	High side to pin #8 (grid) 12SA7. Low side to B-.	"	"	"	A3,A4.	"
"	"	1620KC	"	"	A5	"
50 MMFD	High side to ext. ant. clip. Low side to chassis.	1400KC	Tune in 1400 KC signal. Set pointer at 1400KC	"	A6	Adjust for maximum output. For this adjustment replace chassis and back in cabinet.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AIRLINE PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AIRLINE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
6A	50	150	45A341	2N521	DHN-2x50-150	TA-530	PRS150-40-40	EZ5515	Filter - Red
B	50	150							" - Blue
7	.1	400	D67104	TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
8	.2	200	B67204	TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating
9	.01	200	B66103	TP421	S-4-01	TC-11	484-.01	DT4S1	50L6 Plate Bypass
10	.01	200	B66103	TP421	S-4-01	TC-11	484-.01	DT4S1	Audio Coupling
11	.01	200	B66103	TP421	S-4-01	TC-11	484-.01	DT4S1	" "
12	.08	200	B66803	TP452	S-4-1	TC-1	484-.075	DT4P1	Phono Coupling
13	.05	200	B66503	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
14	.001	400	D67102	TP404	S-4-001	TC-21	484-.001	DT6D1	Ant. Coupling
15	270	500	47X445	MC240	M0.5-325	1FM-325	1468-.00025	5W5T25	Audio Plate Bypass
16A	50	500	47X112	MC225	M0.5-45	1FM-45	1468-.0005	5W5T5	Diode Filter
B	50	500		MC225	M0.5-45	1FM-45	1468-.0005	5W5T5	" "
17	47	500	47X446	MC225	M0.5-45	1FM-45	1468-.0005	5W5T5	Osc. Grid Capacitor

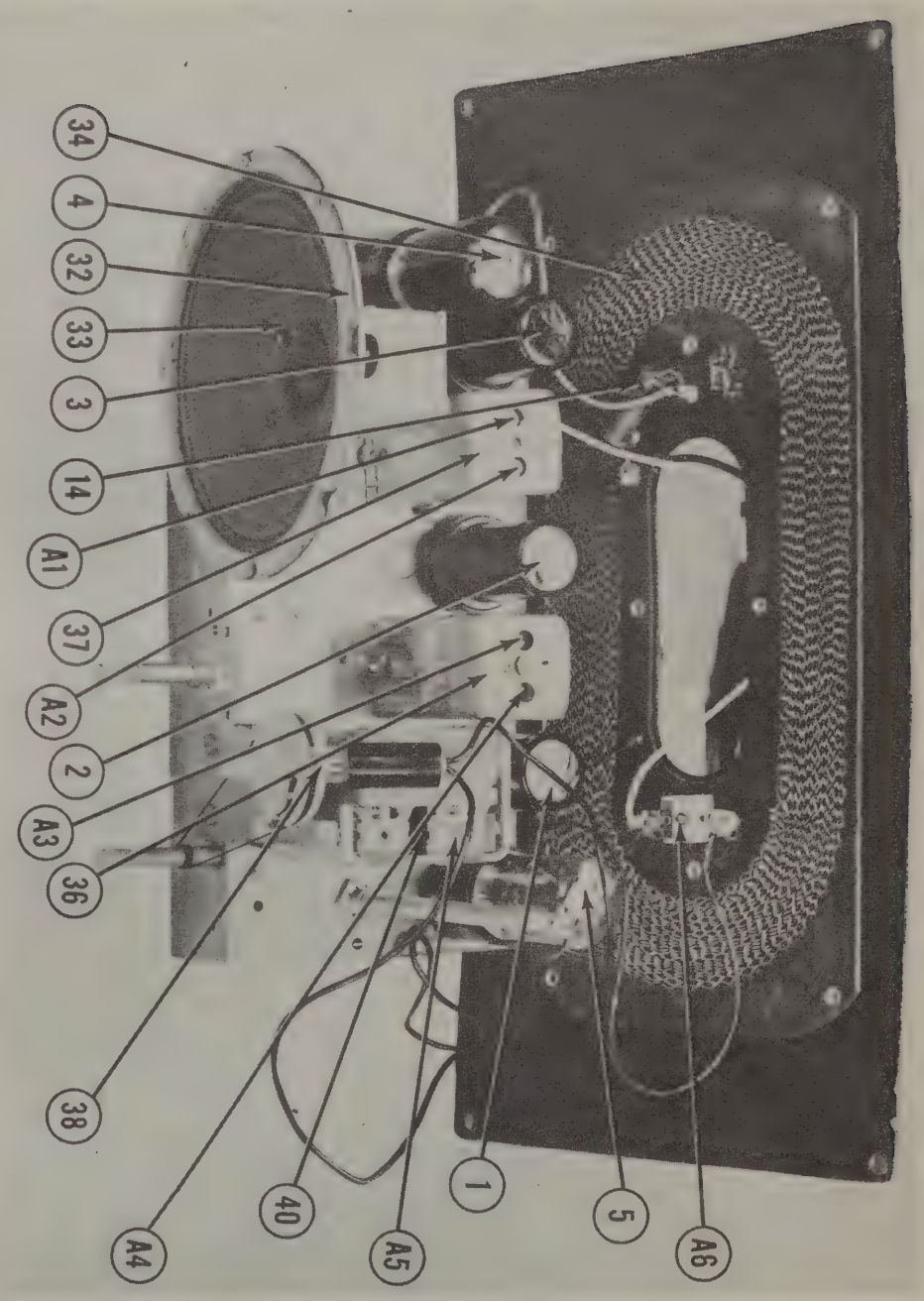
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
18A	500KΩ	1	36X340	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 18A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AIRLINE PART No.	IRC PART No.	
19	39KΩ	½	B84393	BTS-39K	Or.-White-Or. Osc. Grid
20	2.2 Meg.	½	B85225	BTS-2.2 Meg	Red-Red-Grn. AVC Network
21	47KΩ	½	B85473	BTS-47K	Yl.-Vi.-Or. IF Filter
22	6.8 Meg.	½	B85685	BTS-6.8 Meg.	Blue-Gray-Grn. 1st AF Grid
23	470KΩ	½	B84474	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
24	470KΩ	½	B85474	BTS-470K	Yl.-Vi.-Yl. Output Grid
25	150Ω	½	B83151	BW-½-150	Br.-Grn.-Br. Output Cathode
26	220KΩ	½	B85224	BTS-220K	Red-Red-Yl. Line Isolating
27	27Ω	½	B84270	BW-½-27	Red-Vi.-Blk. Rectifier Ballast
28	1500Ω	1	C85152	BTA-1500	Br.-Grn.-Red Filter
29	1 Meg.	½	B85105	BTS-1 Meg.	Br.-Blk.-Grn. Series Phono
30	33Ω	1	C85330	BW-1-33	Or.-Or.-Blk. Line Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AIRLINE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
31	2500Ω	3.4Ω	200Ω	.65Ω	51X119	A-3876	T-14S82		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AIRLINE PART No.	JENSEN PART No.		
32	FIELD PM	VC IMP. 3.4Ω	12A429	ST-109*		*Fabricate new mounting bracket.
33	CONE DIA. 4-3/4"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	AIRLINE PART No.	MEISSNER PART No.	
34	Loop Ant.	.2Ω	1.5Ω	9A-1795		
35	Osc. Coil	.5Ω	6Ω	9A-1805	14-1040	
36	Input IF	22Ω	21.8Ω	9A-1782	16-6658	
37	Output IF	25.3Ω	19.5Ω	9A-1783	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					AIRLINE PART No.		
38	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
39	Switch	2A355	Radio-Phono
40	Tuning Cap.	14A176	2 Gang Variable Cap.
A6	Trimmer Cap.	17A1231	Ant. Adjustment 1-12 MMF
	Knob	10A297	On-Off Switch-Volume, Tuning
	"	10A526	Phono Switch
	Crystal	Astatic L-75	or equivalent
	Switch	2A170	Phono On-Off
	Dial	58X585	
	Pointer	15X216	Dial

DISASSEMBLY INSTRUCTIONS

1 - Remove volume on-off switch and tuning control push on type knobs.

2 - Remove the four clips holding antenna loop back board to cabinet.

3 - Disconnect phono-motor plug.

4 - Disconnect phono-pickup jack from chassis.

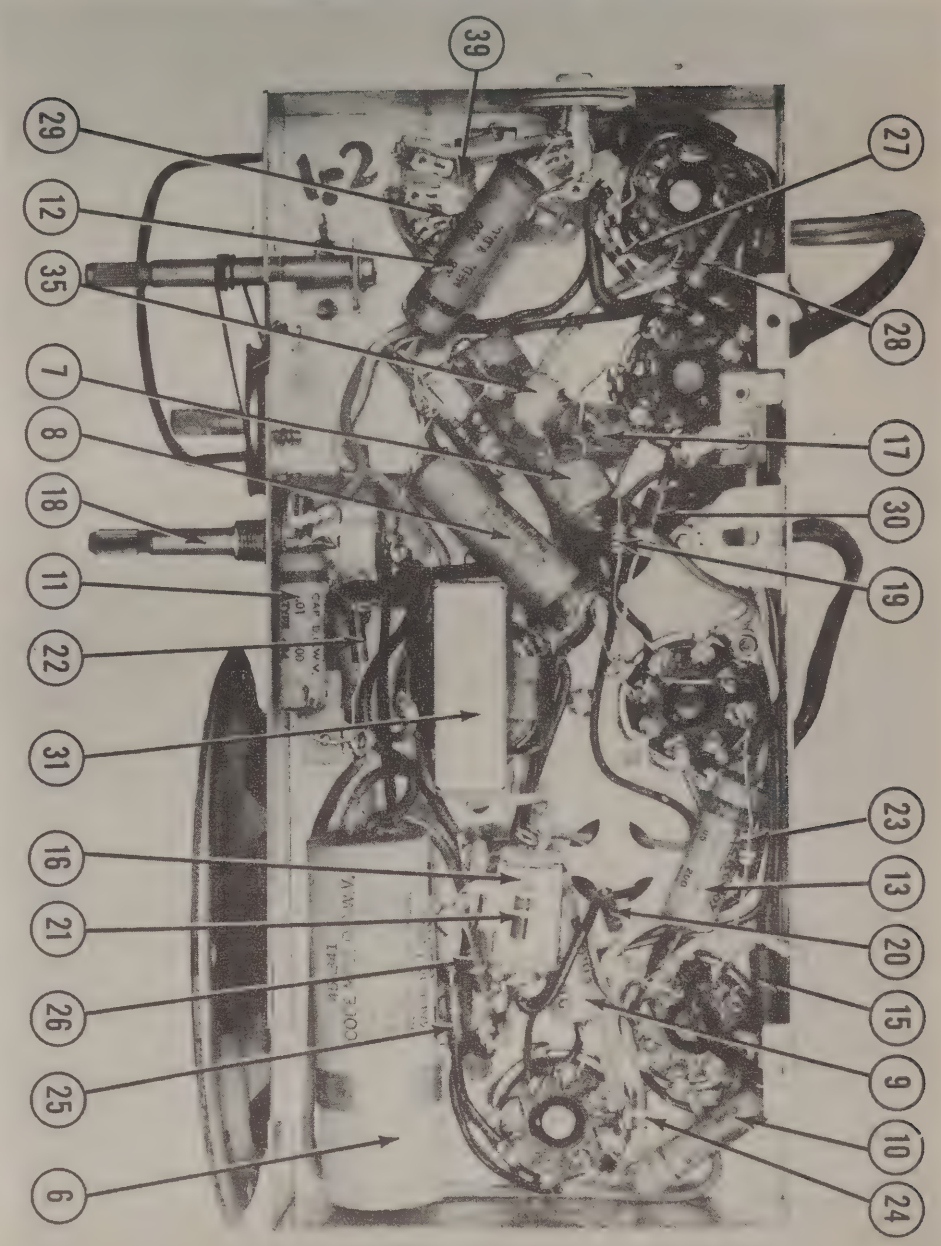
5 - Remove four hex screws and washers from bottom of cabinet.

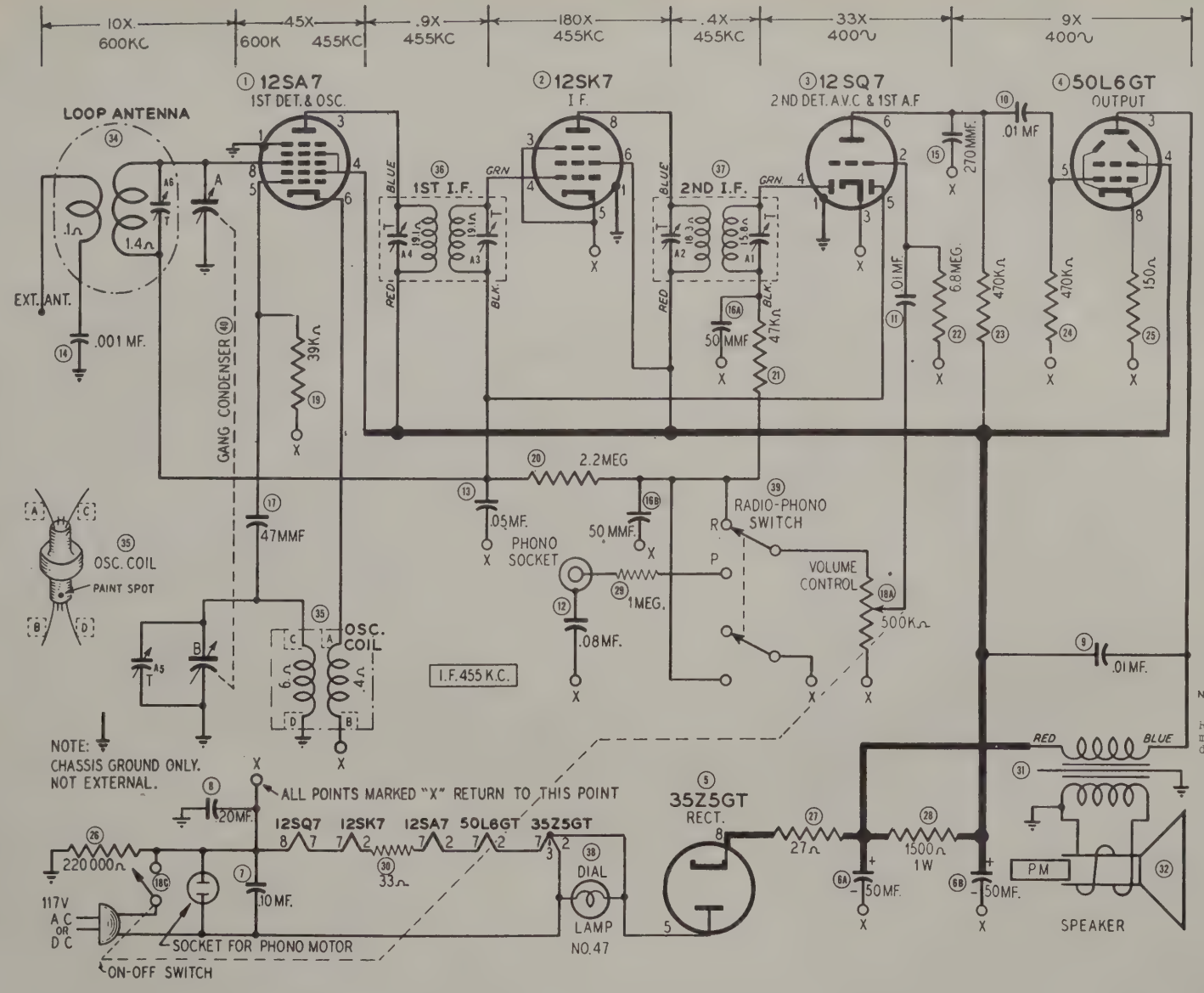
6 - Remove phono-radio push-on knob from phono compartment.

7 - Remove radio dial pointer from dial assembly.

8 - Remove chassis and antenna loop from cab.

CHASSIS—BOTTOM VIEW





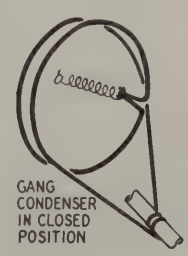
Pin No	12SA7 Volt	12SA7 Res	12SK7 Volt	12SK7 Res
1	0V.	250K Ω	0V.	250K Ω
2	27.5V.AC	56 Ω	22.5V.AC	22 Ω
3	82V.DC	79K Ω	0V.	0 Ω
4	82V.DC	79K Ω	-.45V.DC	2.4 MEG
5	-3.2V.DC	38K Ω	0V.	0 Ω
6	0V.	.5 Ω	82V.DC	79K Ω
7	40V.AC	70 Ω	11.2V.AC	12 Ω
8	-.45V.DC	2.4 MEG	82V.DC	79K Ω

Pin No	12SQ7 Volt	12SQ7 Res	50L6GT Volt	50L6GT Res
1	0V.	250K Ω	0V.	1 NF
2	-.5V.DC	6 MEG	88V.AC	115 Ω
3	0V.	0 Ω	115V.DC	78K Ω
4	-.12V.DC	550K Ω	82V.DC	79K Ω
5	-.45V.DC	2.4 MEG	0V.	460K Ω
6	45V.DC	550K Ω	0V.	1 NF
7	11.2V.AC	12 Ω	40V.AC	70 Ω
8	0V.	0 Ω	5.2V.DC	148 Ω

Pin No	35Z5GT Volt	35Z5GT Res
1	0V.	1 NF
2	117V.AC	145 Ω
3	113V.AC	142 Ω
4	82V.DC	79K Ω
5	113V.AC	142 Ω
6	120V.DC	78K Ω
7	88V.AC	115 Ω
8	122V.DC	78K Ω

NOTE: VOLT. & RES. TAKEN IN RADIO POSITION.

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.



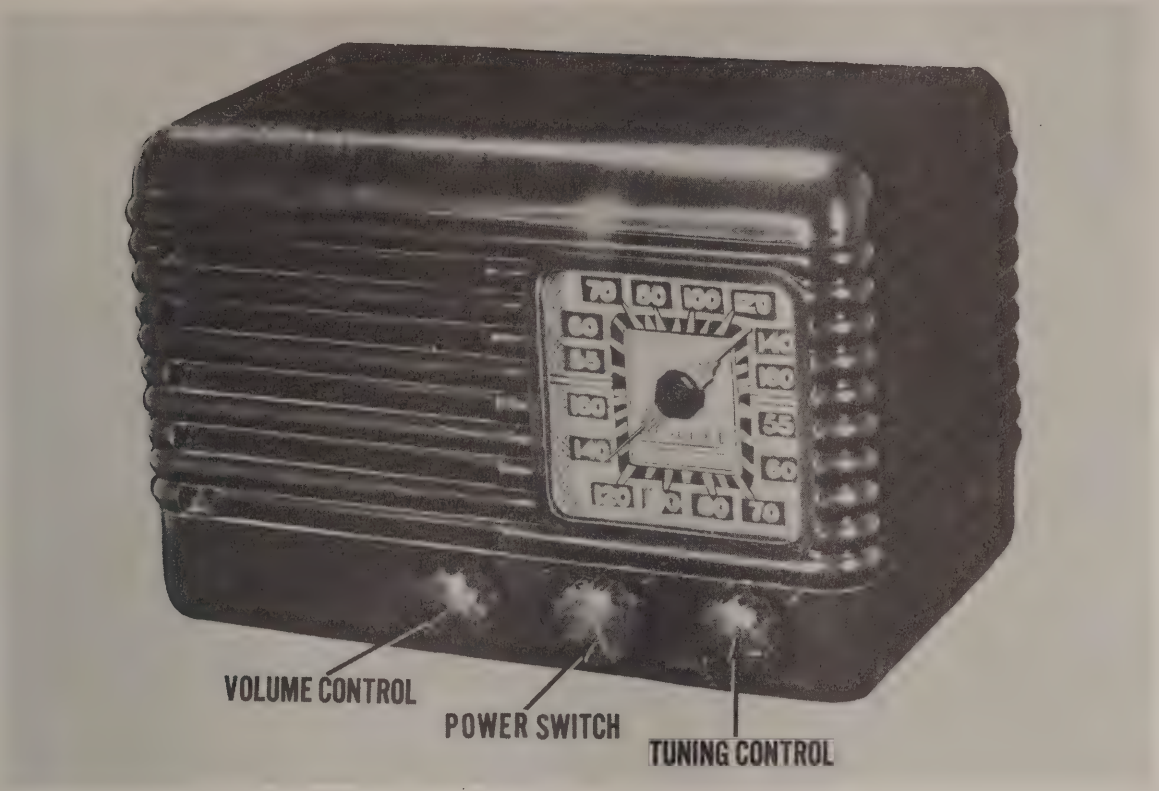
DRIVE CORD DIAGRAM

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

465-6

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



HOWARD
MODEL 920

HOWARD
MODEL 920

HOWARD MODEL 920

TRADE NAME	Howard Model 920
MANUFACTURER	Howard Radio Co., 1735 Belmont Ave., Chicago 13, Ill.
TYPE SET	Battery Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 1R5 Converter, 1U4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output.
POWER SUPPLY	90 Volt "B" Battery & 1½ Volt "A" Battery - RAY-O-VAC Battery #AB-82 or equivalent.
TUNING RANGE--BROADCAST	540-1600KC RATING 15MA @ 90V DC & 235 MA @ 1.5V DC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD.	High side to stator of front section of variable. Low side to chassis.	455KC	High freq.end of dial.(Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ant. clip. Low side to ground clip.	1600KC	1600KC	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: HOWARD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AT	
2	IF Amp.	1U4	1U4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3Q4	3Q4	7BA	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: HOWARD PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
5	10	150	CE-0008	TC42	M-10-150	UT-121	PRS150-10	BR1215	Pwr. Supp. Bypass
6	.002	400		TP405	S-6-002	TC-22	484-002	DT6D2	3Q4 Plate Bypass
7	.01	400		TP421	S-4-01	TC-21	484-01	DT4S1	Bias Filter
8	.01	400		TP421	S-4-01	TC-21	484-01	DT4S1	Audio Coupling
9	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Audio Screen Bypass
10	.006	400		TP409	S-6-006	TC-26	484-006	DT6D6	Audio Coupling
11	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
12	.01	400		TP421	S-4-01	TC-21	484-01	DT4S1	IF Grid Bypass
13	.01	400		TP421	S-4-01	TC-21	484-01	DT4S1	Conv. Screen Bypass
14	50	500		MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Audio Plate Bypass
15	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
16	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
17	50	500		MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HOWARD PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
18A	500KΩ	1	VC-0003	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 18A per instruction

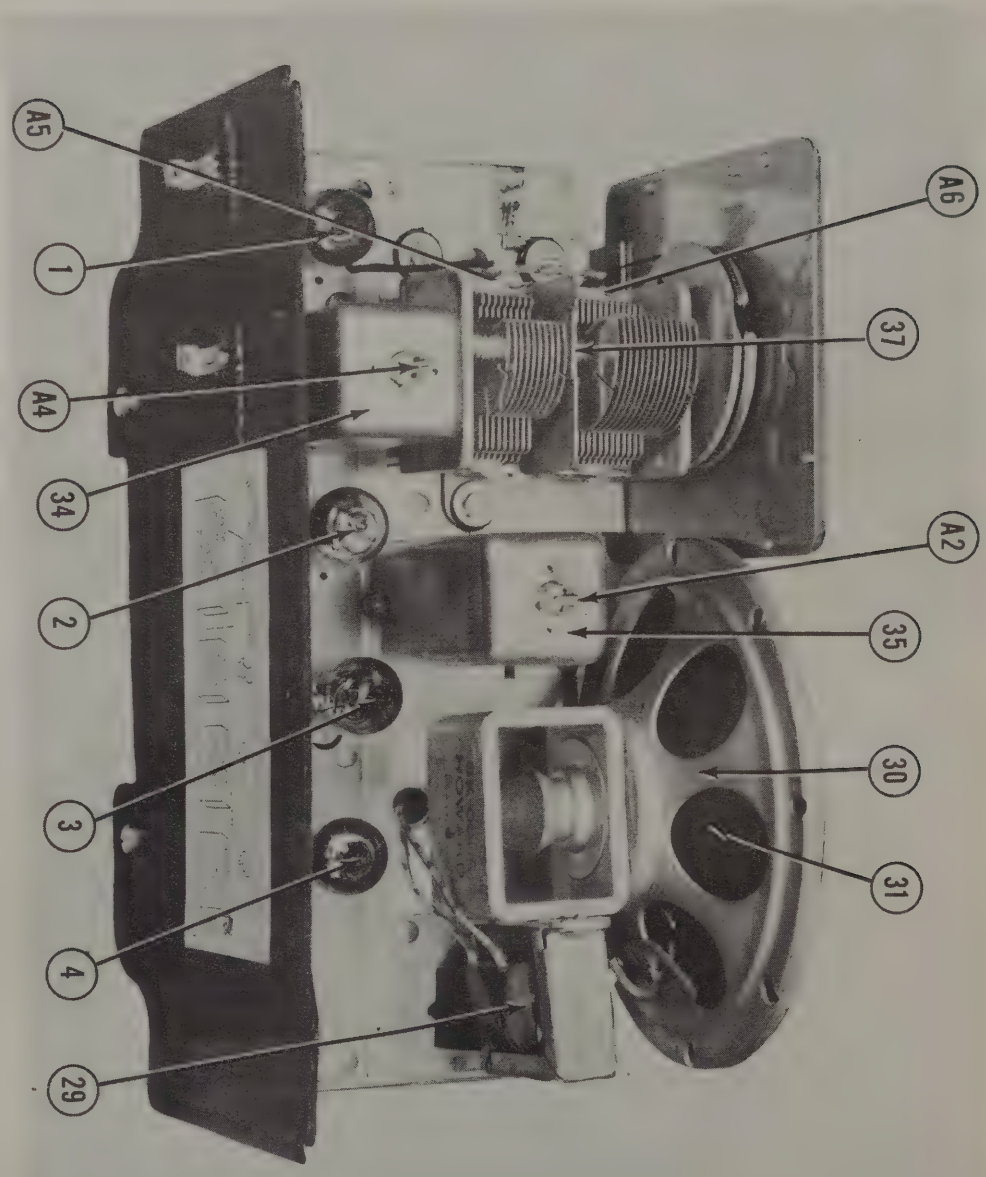
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: HOWARD PART No.	IRC PART No.	IDENTIFICATION CODES
19	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Osc. Grid
20	68KΩ	½		BTS-68K	Blue-Gray-Or. Osc. Grid
21	6800Ω	½		BTS-6800	Blue-Gray-Red Converter Screen Dropping
22	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue IF Grid
23	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
24	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
25	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
26	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. 1st AF Plate Load
27	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. 1st AF Screen Dropping
28	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: HOWARD PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
29	6400Ω	4.25Ω	250Ω	.4Ω	TO-0004	A-3878	T-22S46		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

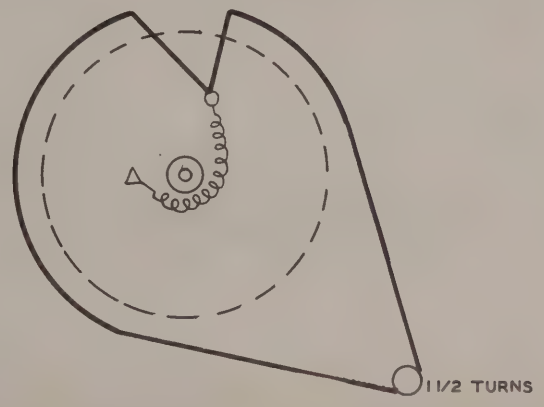
ITEM No.	RATINGS		REPLACEMENT DATA HOWARD PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-107		
30	PM	4.25Ω	SK-0006	Mod. P5-V		
	CONE DIA.	VC DIA.				
31	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA HOWARD PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
32	Ant. Coil	19Ω	2.5Ω	LA0003	14-1026	
33	Osc. "	.5Ω	3Ω	LA0017	14-1040	
34	Input IF	22Ω	23Ω	LI0012	16-6666	
35	Output IF	23Ω	22Ω	LI0013	16-6667	

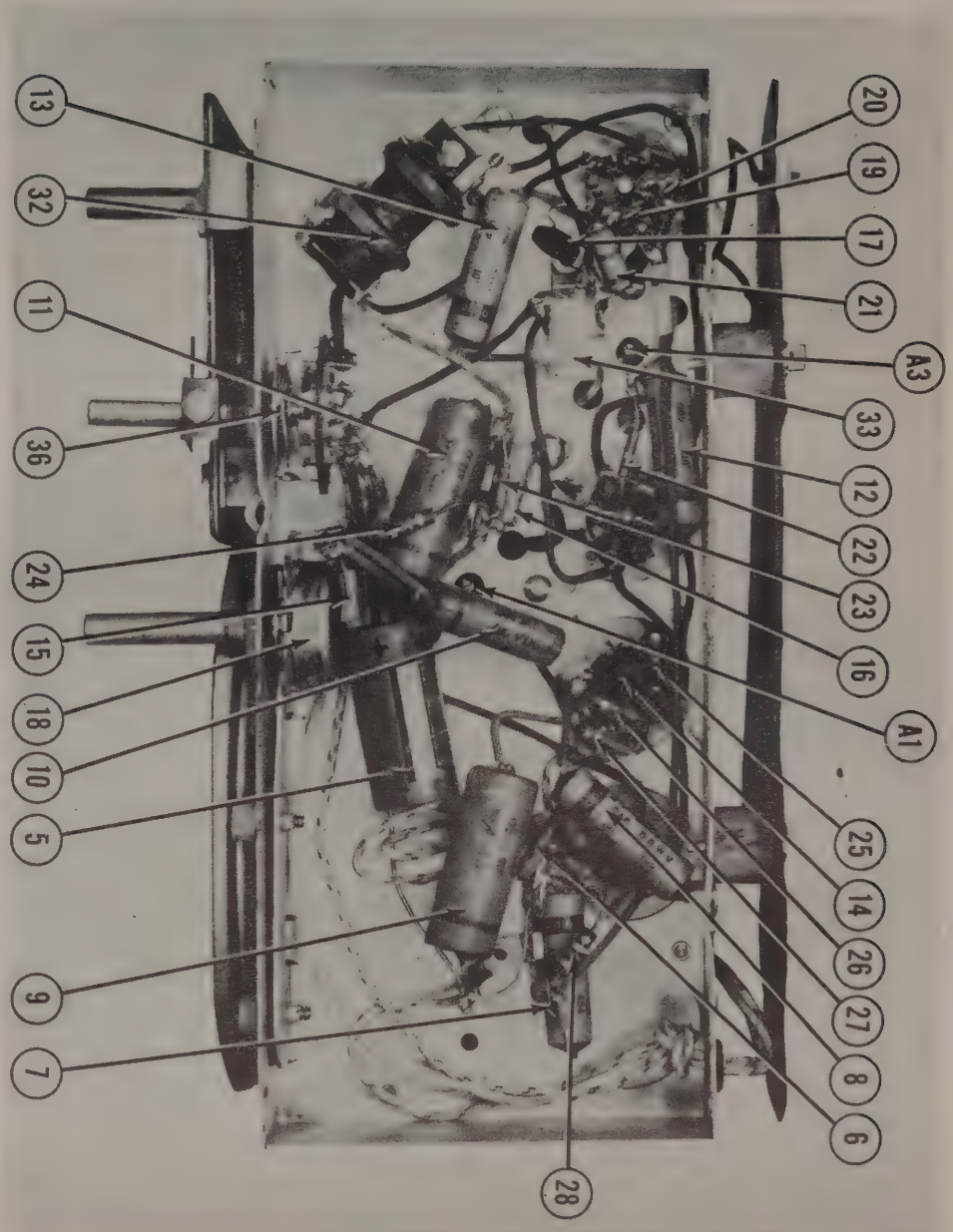
MISCELLANEOUS

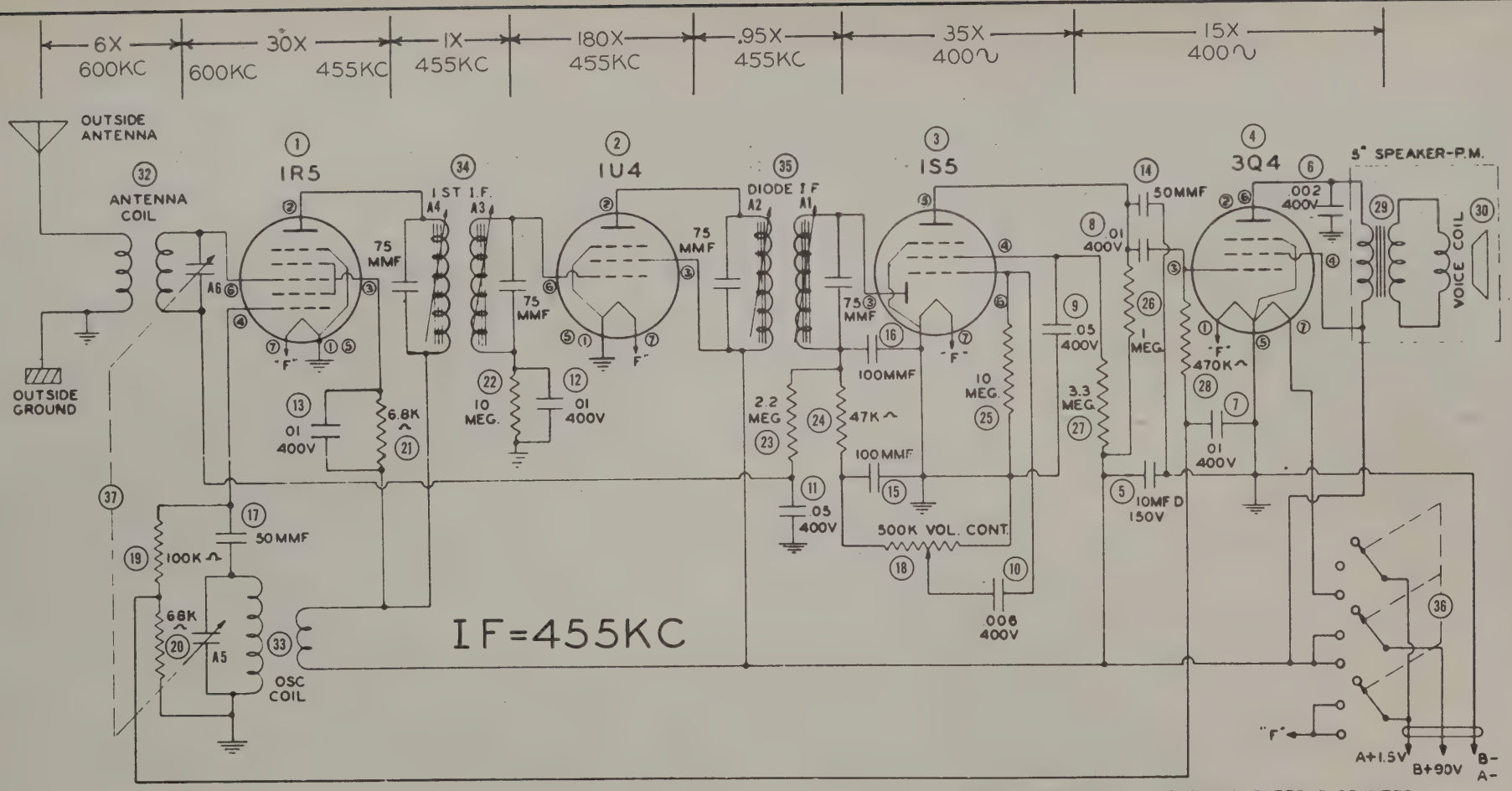
ITEM No.	PART NAME	HOWARD PART No.	NOTES
36	Switch	SW-0008	On-Off, Battery Saver
37	Tuning Cap.	CV-0008	2 Gang Variable Cap.
	Cabinet	CB-0004	Plastic Mottled
	Dial Plate	AR-0002	Calibrated (Plastic)
	Dial Indicator	HD-0001	
	Knob	KB-0009	Walnut



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





REAR VIEW OF SWITCH SHOWN IN EXTREME COUNTER CLOCKWISE POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	0V	94V. DC	72V.DC	-2.3V.DC	0V	0V	1.6V. DC
2	1U4	0V	94V. DC	94V. DC	0V	0V	0V	1.6V. DC
3	1S5	0V	94V. DC	-.25V.DC	20V. DC	11V. DC	0V	1.6V. DC
4	3Q4	1.6V. DC	93V. DC	-.45V.DC	94V. DC	0V	93V. DC	0V

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1R5	*	80KΩ	87KΩ	160K	0Ω	2.6MEG	*
2	1U4	*	80KΩ	80KΩ	1 N F	0Ω	11 MEG	*
3	1S5	*	80KΩ	530KΩ	3.4MEG	1.1 MEG	11 MEG	*
4	3Q4	*	80KΩ	500KΩ	80KΩ	0Ω	80KΩ	*

*DO NOT USE OHMMETER TO CHECK FILAMENT RESISTANCE

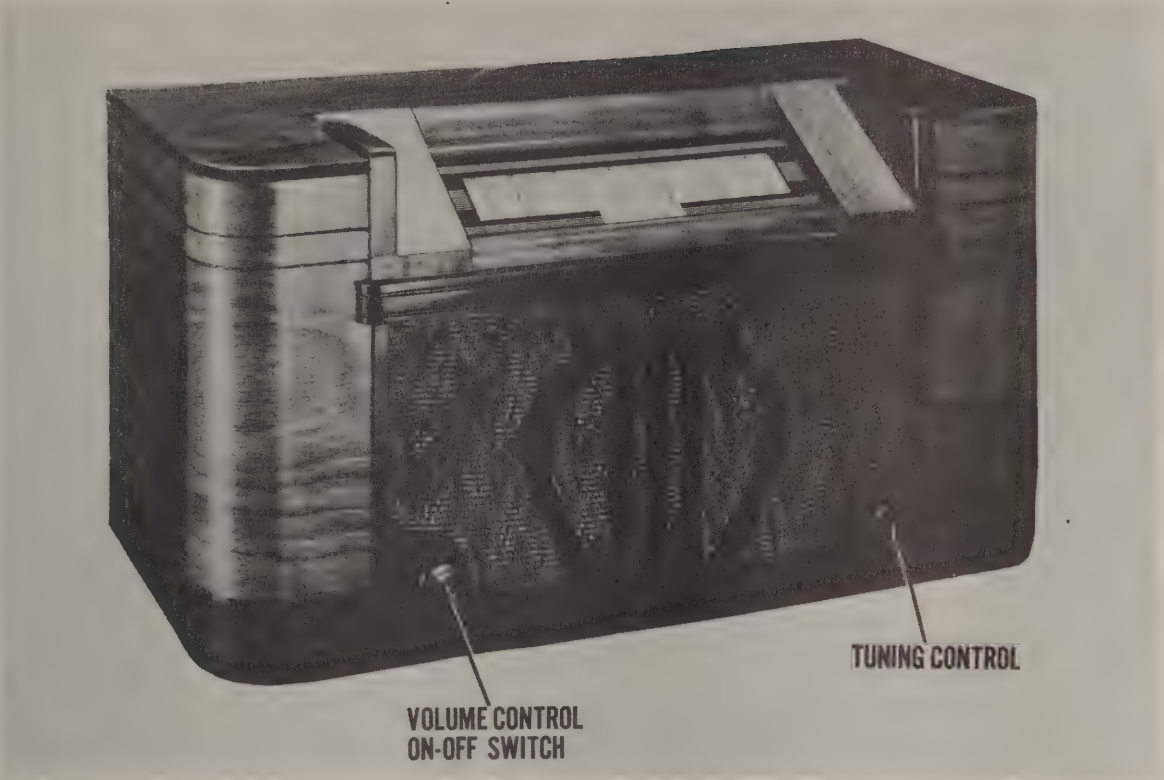
465-7

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



CLARION
MODEL C108

CLARION
MODEL C108

CLARION MODEL C108

TRADE NAME	Clarion Model C108 (Ch. 101)
MANUFACTURER	Warwick Mfg. Corp., 4640 West Harrison St., Chicago, Ill.
TYPE SET	Battery Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 1A7GT Converter, 1N5GT IF Amp., 1H5GT Det.-AVC-AF, 3Q5GT Power Output.
POWER SUPPLY	90 Volt "B" Battery & 1½ Volt "A" Battery-Clarion Battery #AB-820 or equivalent.
TUNING RANGE—BROADCAST	535-1725KC RATING 14MA @ 90V DC & 245MA @ 1.5V DC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD.	High side to grid cap of 1A7. Low side to chassis.	455KC	High freq.end of dial.(Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
250 MMF	High side to ant. lead. Low side to chassis.	1725KC	"	"	A5	" " " "
"	"	1500KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		CLARION PART No.	STANDARD REPLACEMENT		
1	Converter	1A7GT	1A7GT	7Z	
2	IF Amp.	1N5GT	1N5GT	5Y	
3	Det.-AVC-AF	1H5GT	1H5GT	5Z	
4	Power Output	3Q5GT	3Q5GT	7AP	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	CLARION PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
5	4	150	A18-273	TC40	M-4-150	UT-41	PRS150-4	BR415	Pwr. Supp. Bypass
6	.002	600	A16-155	TP405	S-6-002	TC-22	684-002	DT6D2	3Q5 Plate Bypass
7	.01	400	A16-156	TP426	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
8	.01	400	A16-156	TP426	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
9	.02	400	A16-150	TP423	S-4-02	TC-12	484-02	DT4S2	IF Grid Capacitor
10	.05	200	A16-152	TP426	S-4-05	TC-15	484-05	DT4S5	Conv. Screen Bypass
11	.1	200	A16-157	TP428	S-4-1	TC-1	484-.1	DT4P1	RF Bypass Pwr. Supp.
12	.05	200	A16-152	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
13	250	500	A15-176	MC240	MO.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
14	50	500	A15-175	MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor
15	50	500	A15-175	MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Pri. Ant. Shunt

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	CLARION PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	1 Meg.	1	A24-165	MK402	D13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M27	42	SW-A2	" " " " "

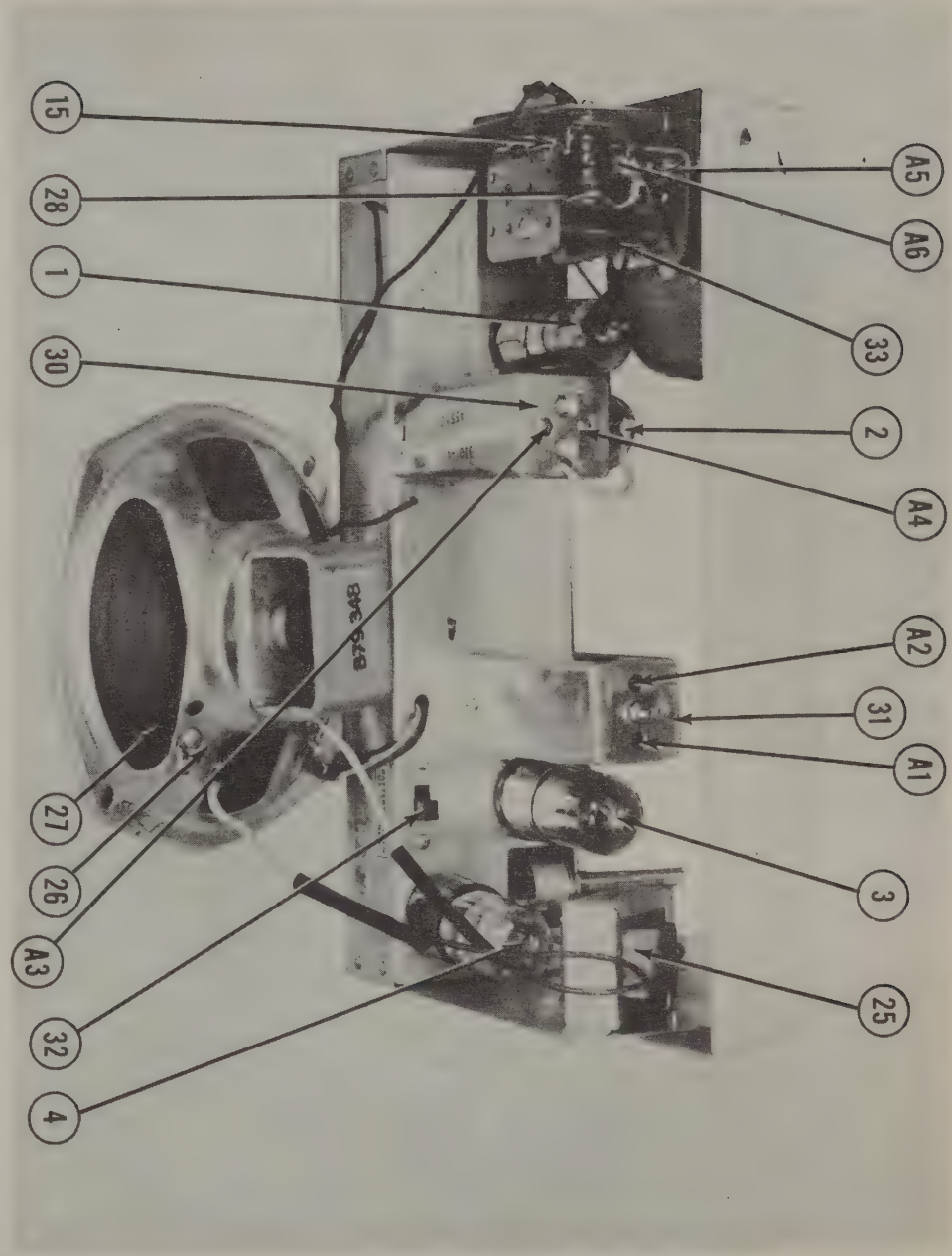
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	CLARION PART No.	IRC PART No.	
17	220KΩ	½	A60-667	BTS-220K	Red-Red-Yl. Osc. Grid
18	47KΩ	½	A60-685	BTS-47K	Yl.-Vi.-Or. Screen Dropping
19	2.2 Meg.	½	A60-664	BTS-2.2 Meg.	Red-Red-Grn. IF Grid
20	4.7 Meg.	½	A60-669	BTS-4.7 Meg.	Yl.-Vi.-Grn. 1st AF Grid
21	470KΩ	½	A60-662	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
22	1 Meg.	½	A60-668	BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
23	390Ω	½	A60-665	BW-½-390	Or.-White-Br. Bias
24	.75Ω	1	A60-691	BW-1-.68	Series Filament

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		CLARION PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
25	10000Ω	3.2Ω	325Ω	.7Ω	A80-226	A-3831	T-14S85		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA CLARION PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-108		
26A b	PM	3.2Ω	B79-346 B79-345	Mod. P6-X		Alternate speaker.
	CONE DIA.	VC DIA.				
27	6"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

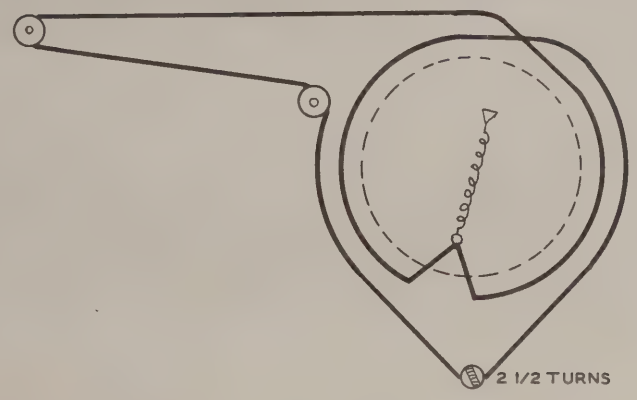
R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CLARION PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
28	Ant. Coil	58Ω	3Ω	A10-414	14-1026	
29	Osc. Coil	2Ω	6Ω	A10-415	14-1040	
30	Input IF	4.5Ω	4.3Ω	B10-416	16-5740	
31	Output IF	6.5Ω		B10-417	16-5742*	

*Add from low end secondary, 250 MMFD cap. to ground, 47KΩ resistor to high end vol. control, 1 Meg. resistor to low end ant. coil secondary.

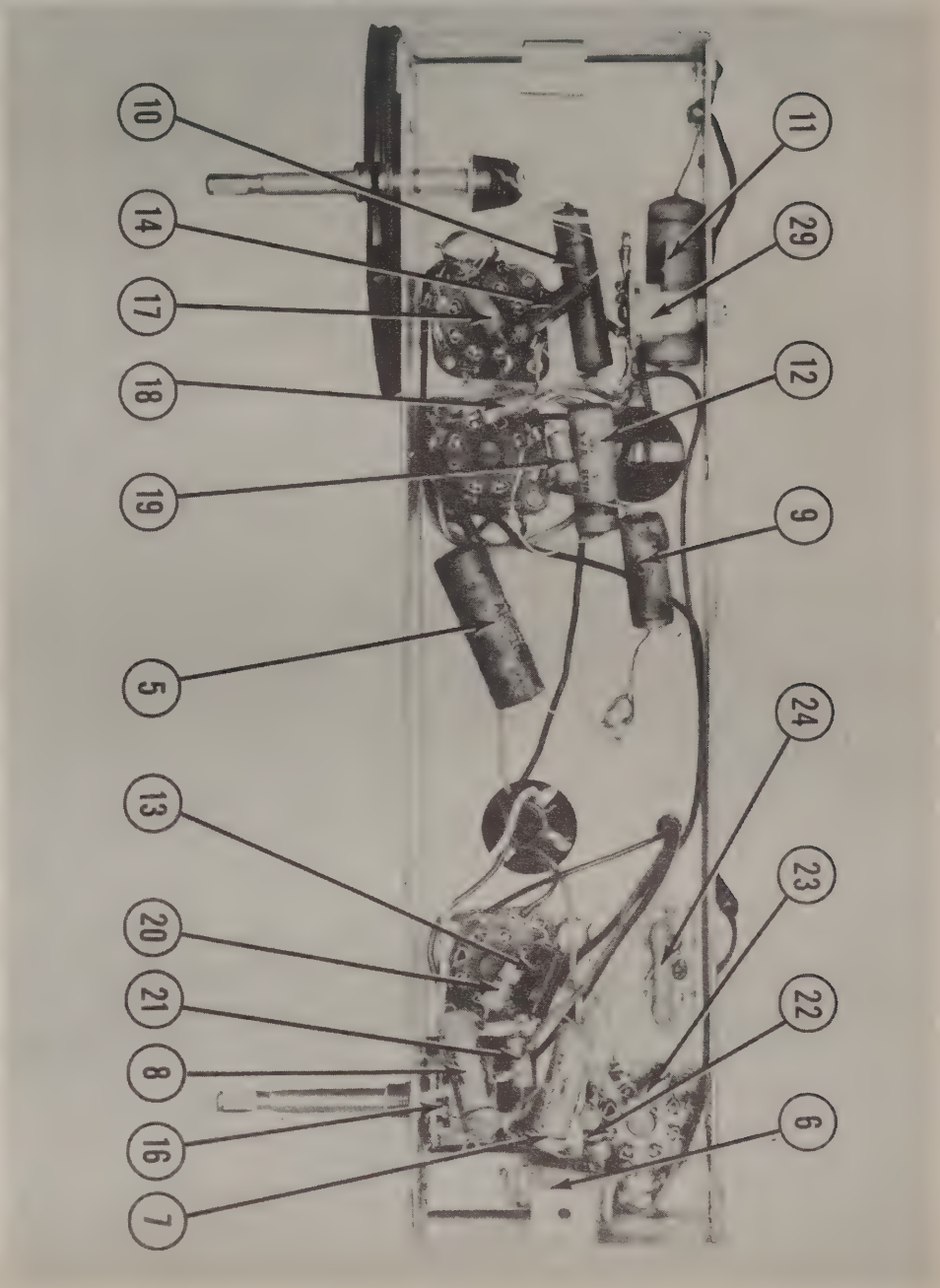
MISCELLANEOUS

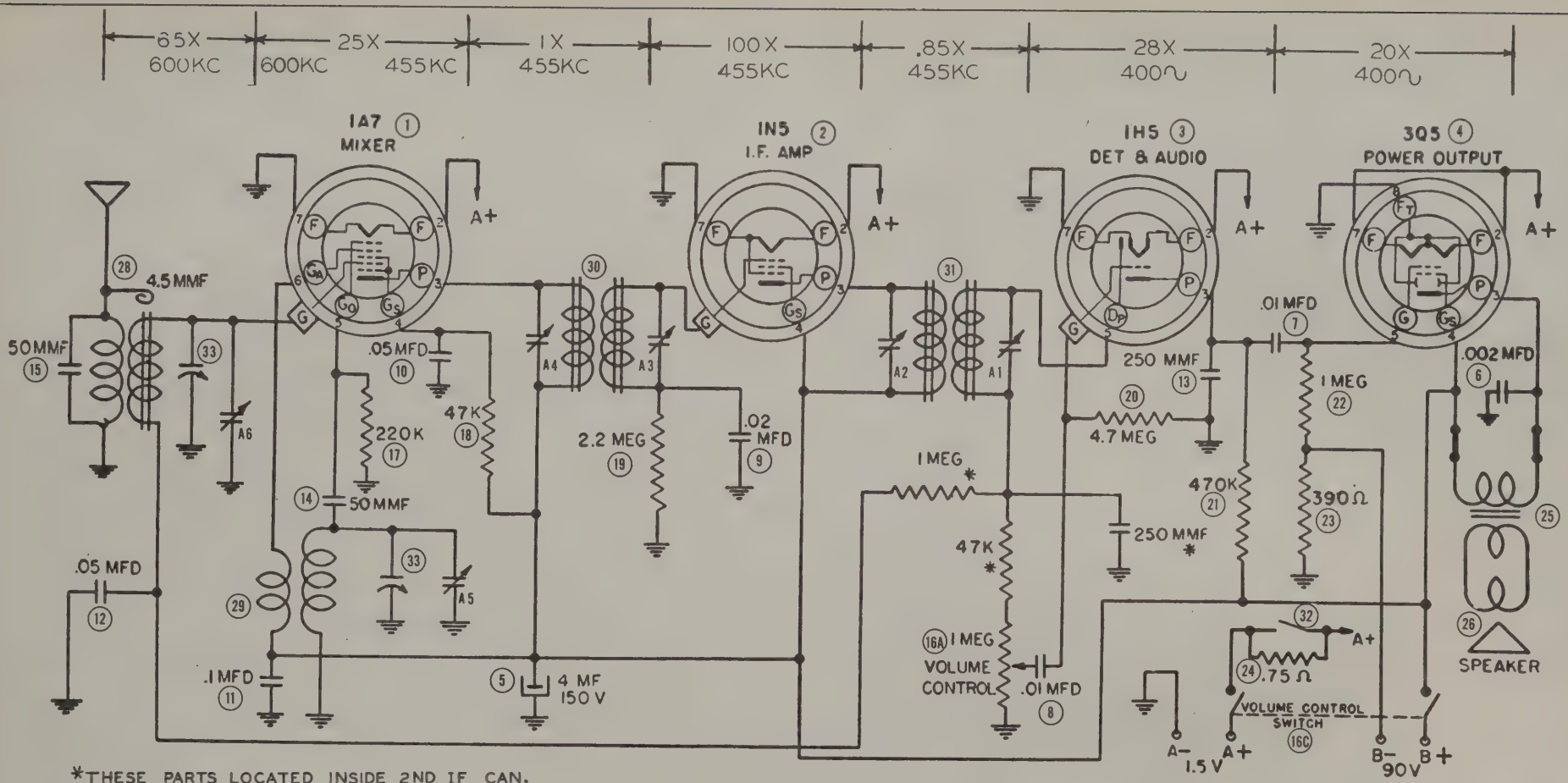
ITEM No.	PART NAME	CLARION PART No.	NOTES
32	Switch	A69-164	Battery Thriftmaster
33	Tuning Cap.	B19-185	2 Gang Variable Cap.
	Dial Scale	B67-478	
	Dial Pointer	A58-42	
	Knob	A52-182	
	Cabinet	D42-377	Wood



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





*THESE PARTS LOCATED INSIDE 2ND IF CAN.

IF=455KC

NOTE: VOLT. & RES. READING TAKEN WITH BATTERY SWITCH IN "NEW" POSITION.

465-8

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	0V.	1.4V.DC	89V.DC	40V.DC	0V.	89V.DC	0V.	0V.	0V.
2	1N5GT	0V.	1.4V.DC	89V.DC	89V.DC	0V.	0V.	0V.	0V.	0V.
3	1H5GT	0V.	1.4V.DC	69V.DC	0V.	0V.	0V.	0V.	0V.	0V.
4	3Q5GT	0V.	1.4V.DC	87V.DC	89V.DC	-.45VDC	-5.4V.DC	1.4V. DC	0V.	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	1A7GT	0Ω	2Ω	62KΩ	109KΩ	185KΩ	62KΩ	0Ω	INF	1.9MEG
2	1N5GT	0Ω	2Ω	62KΩ	62KΩ	INF	2 MEG	0Ω	2.8MEG	2.5MEG
3	1H5GT	0Ω	2Ω	530KΩ	4.5MEG	1MEG	INF	0Ω	0Ω	4.5MEG
4	3Q5GT	0Ω	2Ω	62KΩ	62KΩ	1MEG	360Ω	2Ω	0Ω	

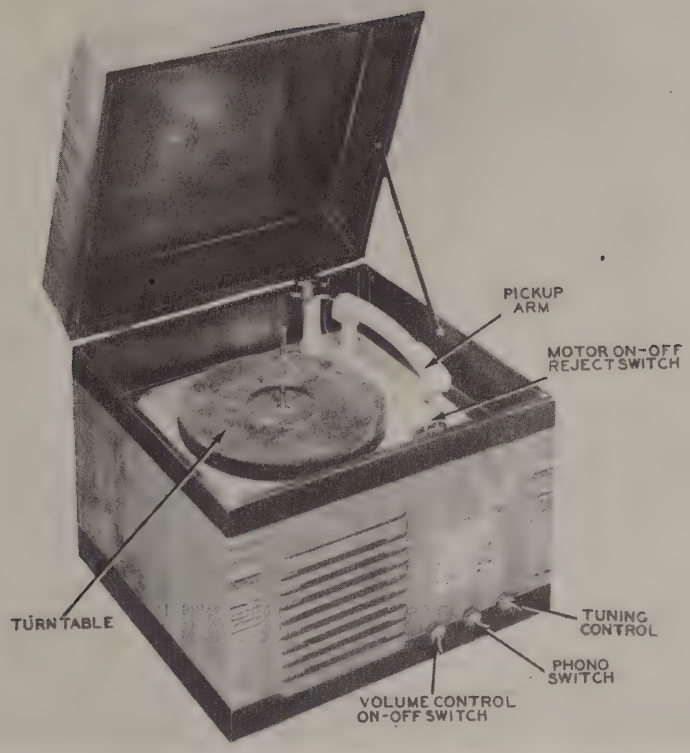
THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is shorted to ground.

1- DC Voltage measurements are at 20,000 ohms per volt: AC Voltages measured at 1000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

CLARION
MODEL C101



CLARION
MODEL C101

CLARION MODEL C101

TRADE NAME	Clarion Model C101
MANUFACTURER	Warwick Mfg. Corp., 4640 W. Harrison St., Chicago, Ill.
TYPE SET	AC Operated Combination Auto. Phono - Superheterodyne Receiver, Self Contained Loop Antenna
TUBES(FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volt AC RATING .250 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1630KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect a .2 Mfd. condenser in series with the low side of the signal generator to chassis. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of rear section of variable. Low side to chassis.	455KC	High freq. end of dial. (Variable fully open.)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
250 MMF	High side to ext. ant. clip. Low side to ext. ground.	1630KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: CLARION PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CLARION PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150	18-266	2N513	M-2x30-150	TA-330	PRSA150-40-40	BRL3315	Filter - Yellow
B	30	150							" - Red
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	50L6 Plate Bypass
9	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
10	.004	400		TP407	S-6-004	TC-24	484-004	DT6D4	" "
11	.1	400		TP429	S-4-1	TC-1	484-.1	DT4P1	Phono Coupling
12	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
13	250	500		MC240	M0.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
14	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
15	50	500		MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500KΩ	1	24-153	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions.
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

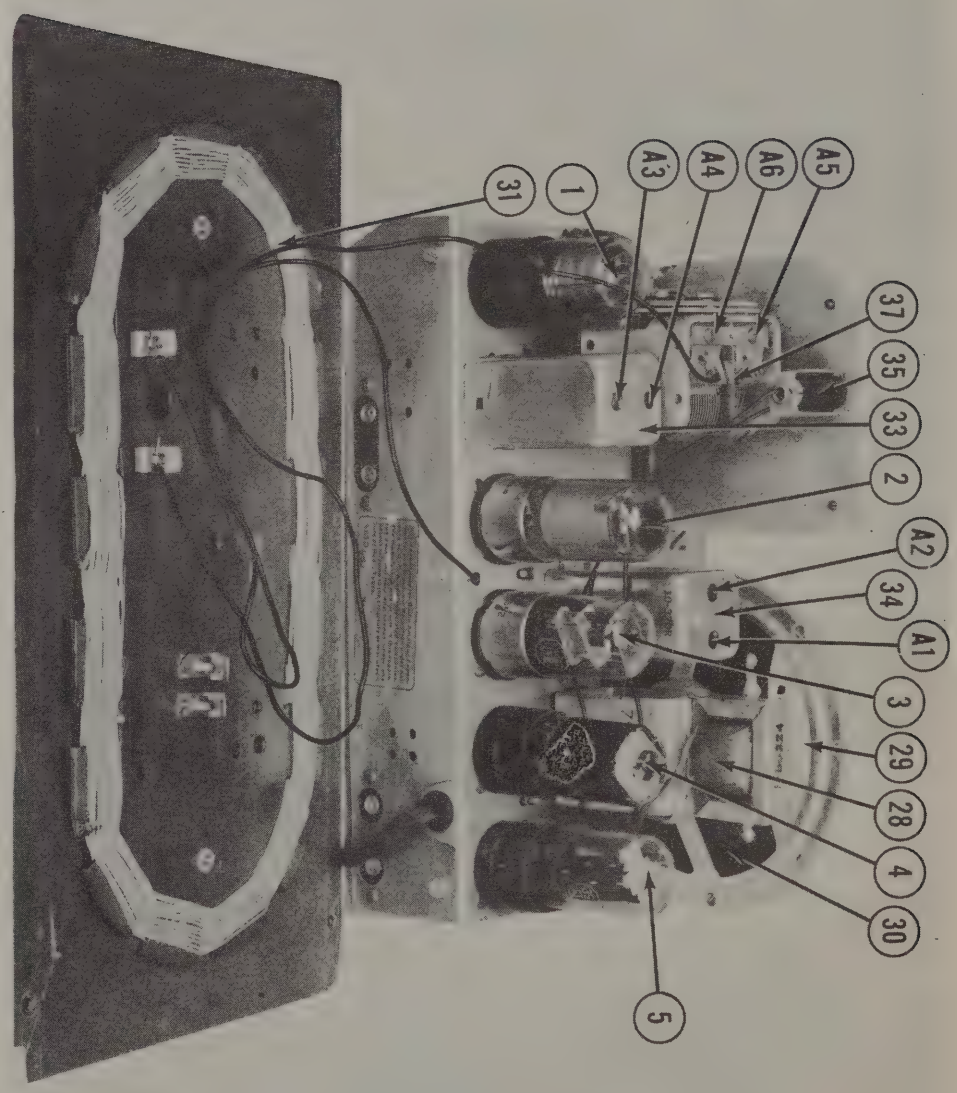
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CLARION PART No.	IRC PART No.	IDENTIFICATION CODES
17	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
18	2 Meg.	½		BTS-2.2 Meg	Red-Blk.-Grn. AVC Network
19	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
20	1 Meg.	1/3		BTS-1 Meg.	Br.-Blk.-Grn. Series Phono
21	200KΩ	½		BTS-220K	Red-Blk.-Yl. 1st AF Plate Load
22	500KΩ	½		BTS-470K	Grn.-Blk.-Yl. Output Grid
23	120Ω	½		BW-½-120	Br.-Red-Br. Output Cathode
24	10KΩ	1		BTA-10K	Br.-Blk.-Or. Bleeder
25	27Ω	½		BW-½-27	Red-Vi.-Blk. Surge Limiter
26	1000Ω	½		BTS-1000	Br.-Blk.-Red Filter
27	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue AVC Network-See Note 1

Note 1 - Not used in all models.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CLARION PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
28	1970Ω	3.1Ω	142Ω	.6Ω	80-224	A-3876*	T-14S82*		*Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA CLARION PART No.	REPLACEMENT DATA JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-106		
29	PM	3Ω	79-339	Mod. P5-W		
	CONE DIA.	VC DIA.				
30	4½	½"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CLARION PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
31	Loop Ant.	0Ω	1Ω	82-32		
32	Osc. Coil		4.5Ω	10-394	14-1040	
33	Input IF	39Ω	39Ω	10-369	16-6658	
34	Output IF	36Ω	42Ω	10-370	16-6660	

DIAL LIGHT

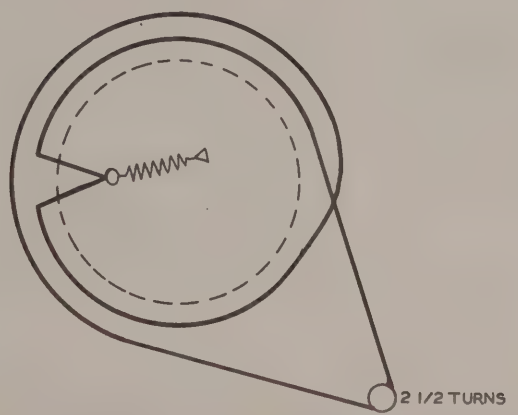
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA CLARION PART No.		INSTALLATION NOTES
35	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

ITEM No.	PART NAME	CLARION PART No.	NOTES
36	Phono Switch	69-162	
37	Tuning Cap.	19-177	2 Gang Variable Cap.

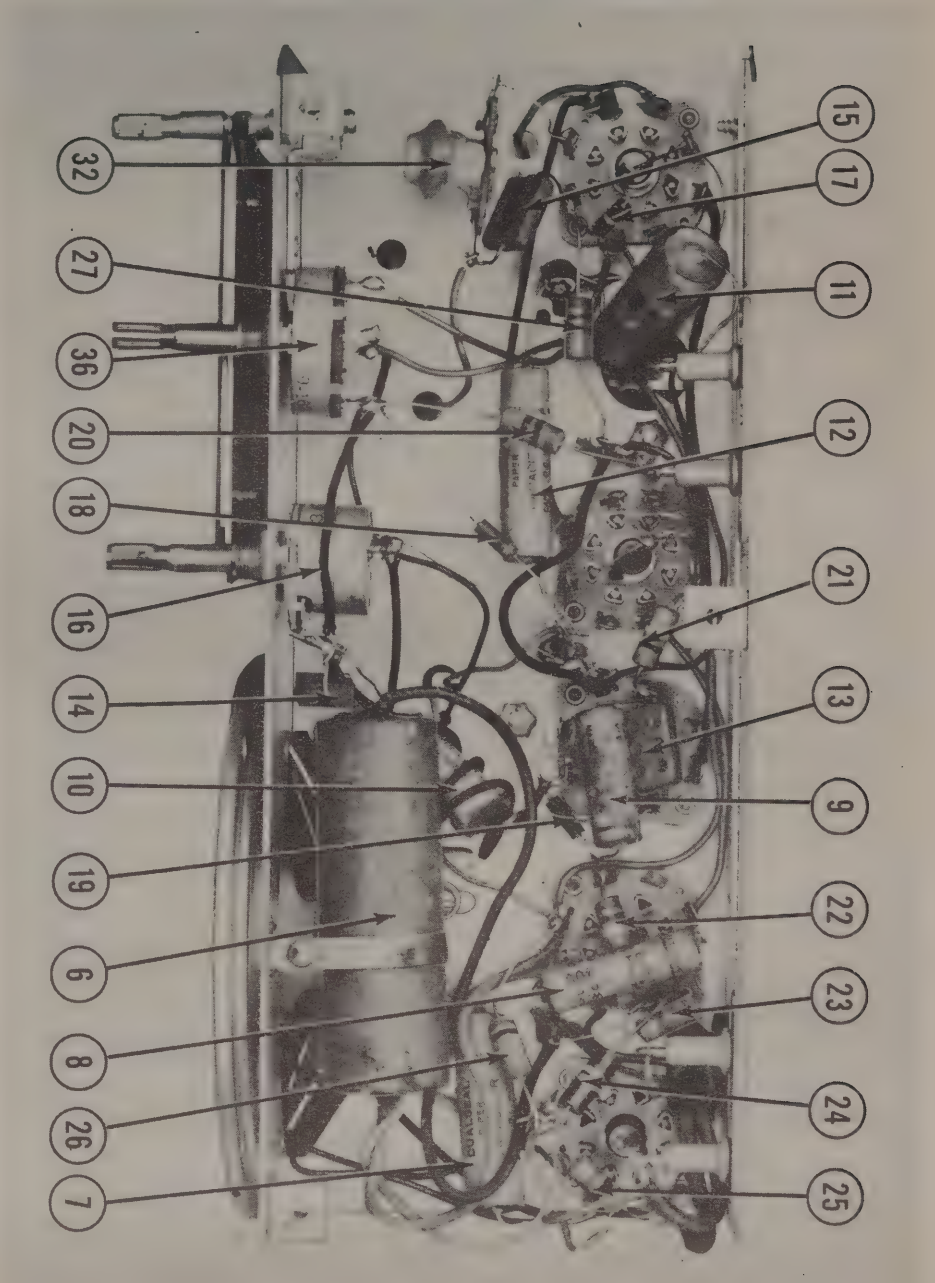
DISASSEMBLY INSTRUCTIONS

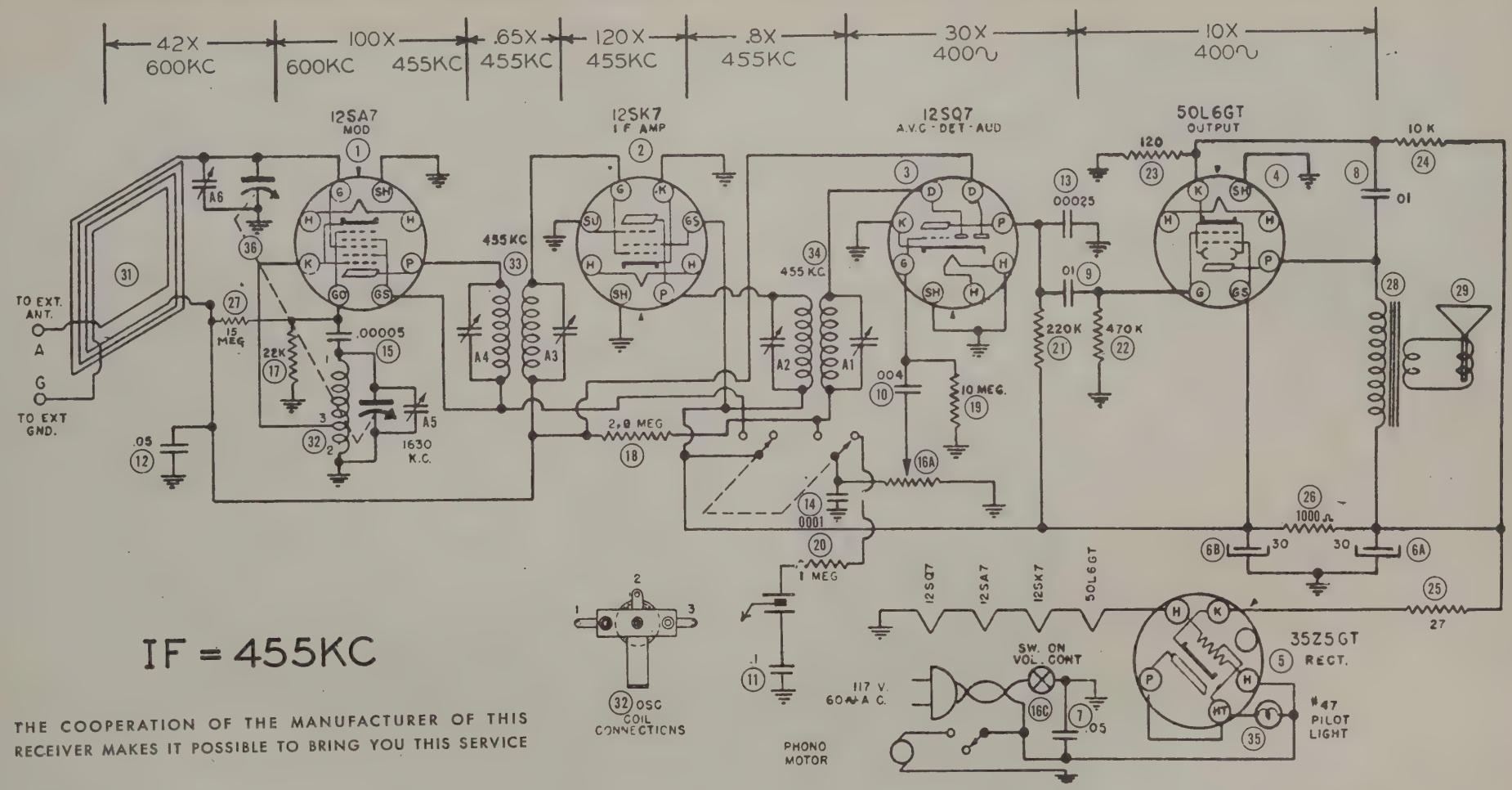
1. Remove volume on-off switch, radio-phono, and tuning push-on type knobs.
2. Remove four wood screws and washers from the back board. Remove back board.
3. Disconnect the phono-motor jacks from the back of chassis.
4. Disconnect phono-pickup jacks from back of chassis.
5. Remove three hex screws and washers holding chassis to cabinet. Remove chassis.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





IF = 455KC

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VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	12.5V.AC	82V.DC	82V.DC	-3V.DC	0V	25.2V.AC	-.7V. DC
2	12SK7GT	0V	25.2V.AC	0V	-.7V. DC	0V	82V. DC	36.8V.AC	82V. DC
3	12SQ7GT	0V	-.55V.DC	0V	-.4V. DC	-.7V. DC	60V. DC	0V	12.5V.AC
4	50L6GT	0V	87V.AC	98V. DC	82V. DC	0V	0V	36.8V.AC	5.4V. DC
5	35Z5GT	0V	117V.AC	113V.AC	106V.DC	113V.AC	0V	87V.AC	107V.DC

RESISTANCE READINGS

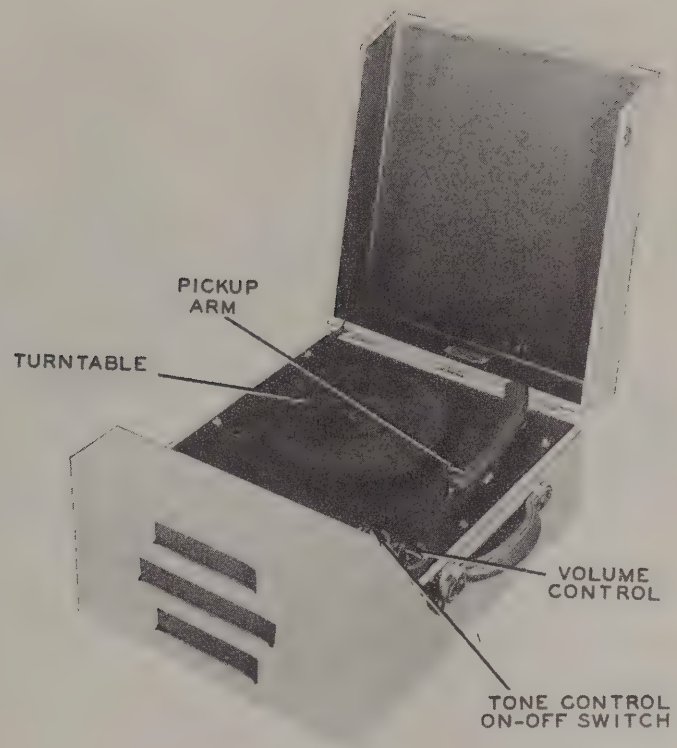
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	12 Ω	11KΩ	11KΩ	19.5KΩ	.5 Ω	23.5 Ω	2.2 MEG
2	12SK7GT	0Ω	23.5Ω	0Ω	2.2MEG	0Ω	11KΩ	35 Ω	11KΩ
3	12SQ7GT	0Ω	10 MEG	0Ω	500KΩ	2.2 MEG	230KΩ	0Ω	12 Ω
4	50L6GT	0Ω	80 Ω	10KΩ	11KΩ	430KΩ	1 N F	35Ω	110 Ω
5	35Z5GT	0Ω	105 Ω	102 Ω.	10KΩ	102 Ω	1 N F	80 Ω	10KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-9

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



AUDAR
MODEL P-1A

AUDAR
MODEL P-1A

AUDAR MODEL P-1A

TRADE NAME Audar Model P-1A
MANUFACTURER Audar Inc., Argos, Indiana
TYPE SET AC Operated Portable Record Player with 3 tube Amp. & Speaker
TUBES (THREE) Types, 12SQ7GT AF Amp., 50L6GT Power Output, 35Z5GT Rectifier.

POWER SUPPLY 117 Volts AC
RATING .220A @ 117V AC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SQ7GT	0V.	0V.	1.2V.DC	0V.	0V.	74V.DC	11.8V.AC	0V.
2	50L6GT	0V.	11.8V.AC	111V.DC	116V.DC	0V.	110V.DC	66V.AC	8V.DC
3	35Z5GT	0V.	66V.AC	73V.AC	121V.DC	117V.AC	0V.	98V.AC	132V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SQ7GT	0Ω	560KΩ	8KΩ	0Ω	0Ω	280KΩ	11.5Ω	0Ω
2	50L6GT	0Ω	11.5Ω	35KΩ	36KΩ	410KΩ	45KΩ	59Ω	142Ω
3	35Z5GT	INF	59Ω	67Ω	35KΩ	215Ω	INF	93Ω	35KΩ

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

1- DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2- Socket connections are shown as bottom views.
3- Measured values are from socket pin to common negative.
4- Line voltage maintained at 117 volts for voltage readings.
5- Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6- Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: AUDAR PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1.	AF Amp.	12SQ7GT	12SQ7GT	8Q	
2	Power Output	50L6GT	50L6GT	7AC	
3	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUDAR PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
4A	50	150		TN129	DSB-40+30+20-150	TA-530		EZ42215	Filter - Red
B	20	150				UT-201			" - White
C	20	150							" - "
5	8	150		TC42	M-8-150	UT-81	PRS150-8	BR815	Audio Plate Decoup.
6	10	25		TC22	M-10-25	TA-10	PRS25-10	BR102A	Audio Cath. Bypass
7	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass
8	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Audio Coupling
9	.0005	600		TP403	S-6-0005	TC-35	1468-0005	DT6T5	Tone Compensation
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Phono Shield Coupling
11	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Isolating

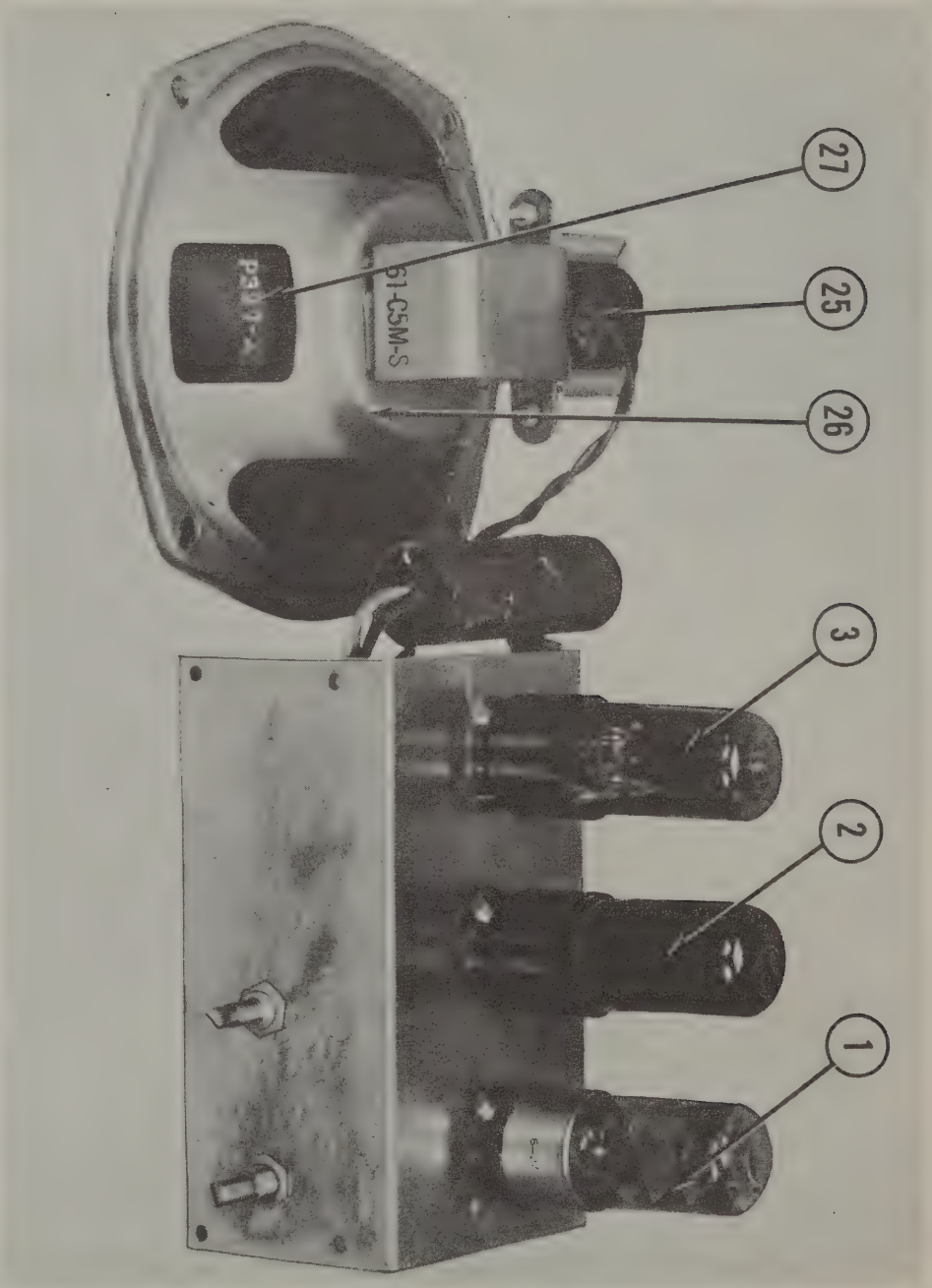
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUDAR PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
12A	1 Meg.	1	VC10105	MR53	D13-137	M-63-Z	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 12A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
13A	2 Meg.	1	24171-1	MR55	D13-139	M-66-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 13A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUDAR PART No.	IRC PART No.	IDENTIFICATION CODES
14	330KΩ	½		BTS-330K	Or.-Or.-Yl. Series Phono.
15	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Tone Compensation
16	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Tone Control Shunt
17	10KΩ	½		BTS-10K	Br.-Blk.-Or. 1st AF Cathode
18	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
19	22KΩ	½		BTS-22K	Red-Red-Or. 1st AF Plate Filter
20	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
21	150Ω	2		BW-2-150	Br.-Grn.-Br. Output Cathode
22	1000Ω	½		BTS-1000	Br.-Blk.-Red Filter
23	220	2		BW-2-220	Red-Red-Br. Filter
24	135Ω	10		AB-150	Line Dropping

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUDAR PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
25	2000Ω	3.4Ω	205Ω	.75Ω		A-3676	T-14S82		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUDAR PART No.	JENSEN PART No.		
26	FIELD PM	VC IMP. 3.4Ω		ST-109		
27	CONE DIA. 6-1/8"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

DISASSEMBLY INSTRUCTIONS

1 - Remove four mounting screws holding changer panel to cabinet. Lift off panel.

2 - Remove two screws holding panel over speaker and remove.

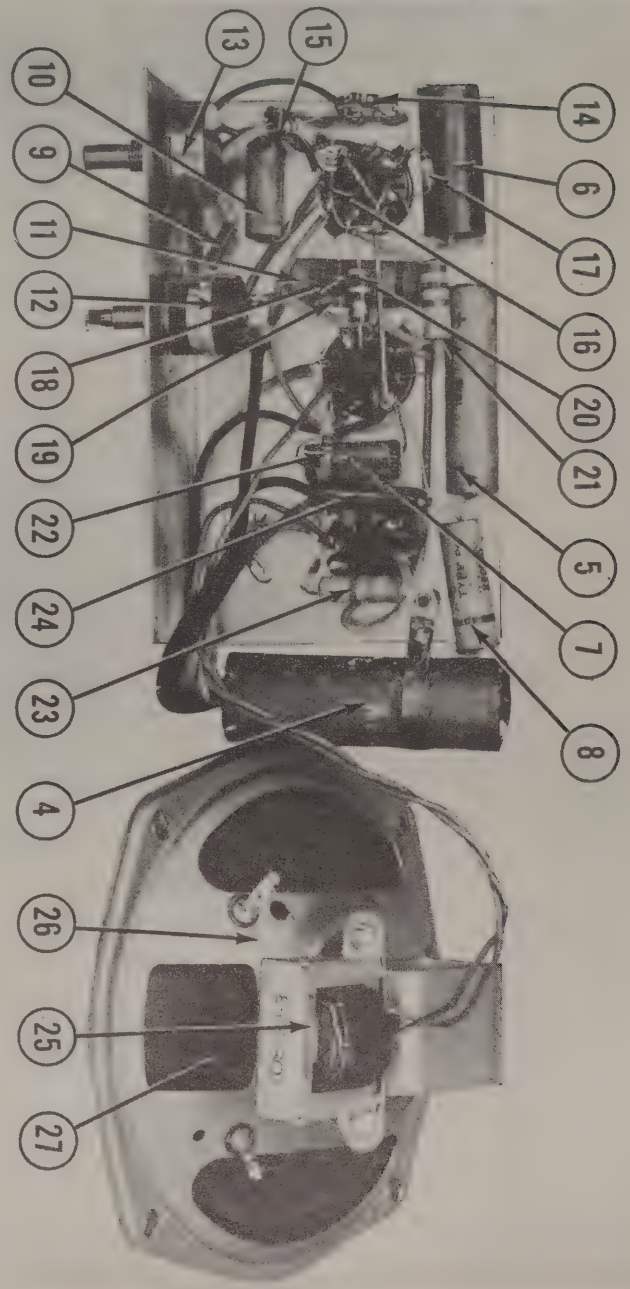
3 - Remove four nuts holding speaker and remove.

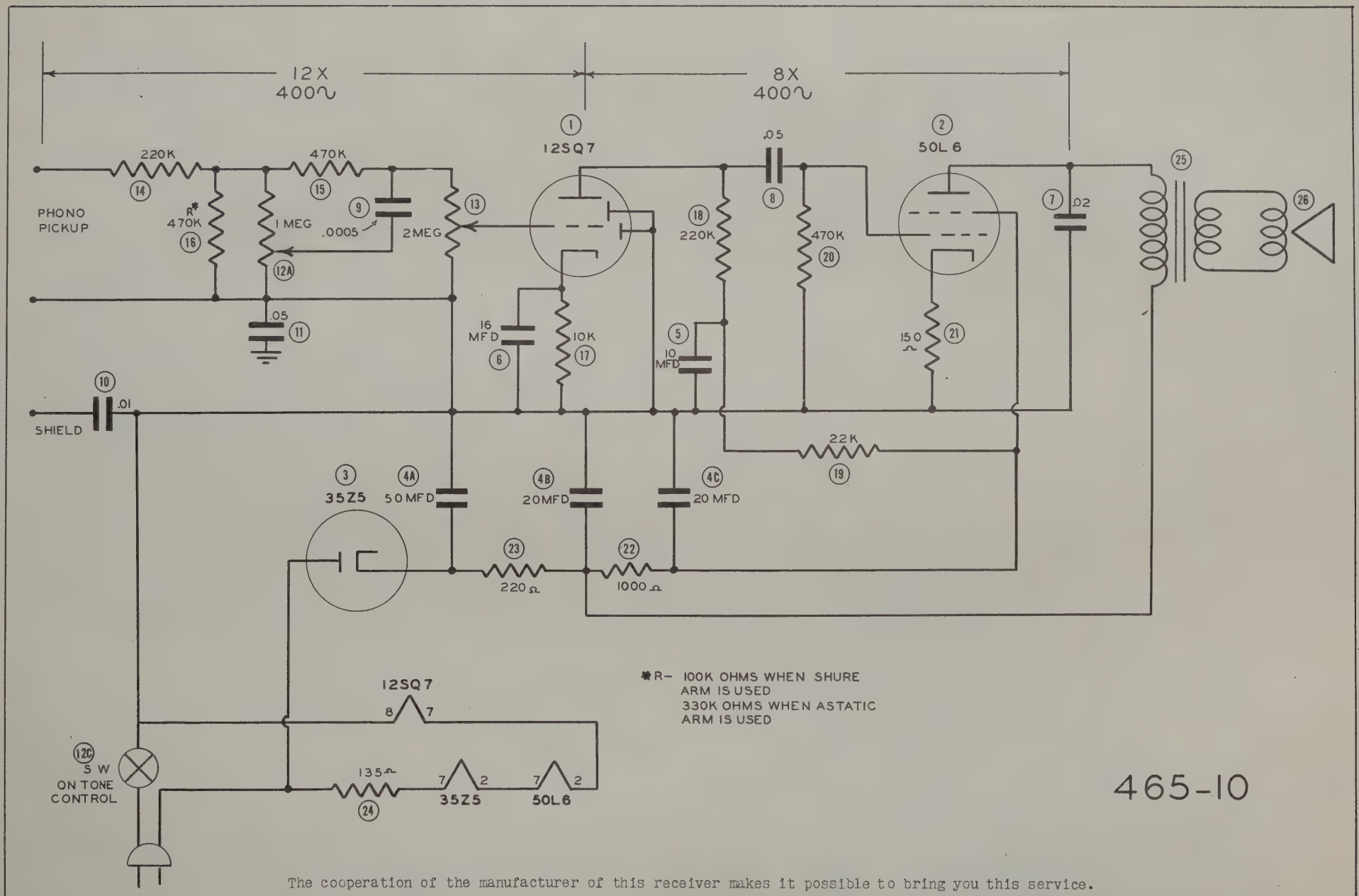
4 - Unsolder phono pickup and phono motor leads.

5 - Remove on-off-treble control knob and volume control knob by loosening set screws.

6 - Remove two screws holding chassis to panel. Remove chassis.

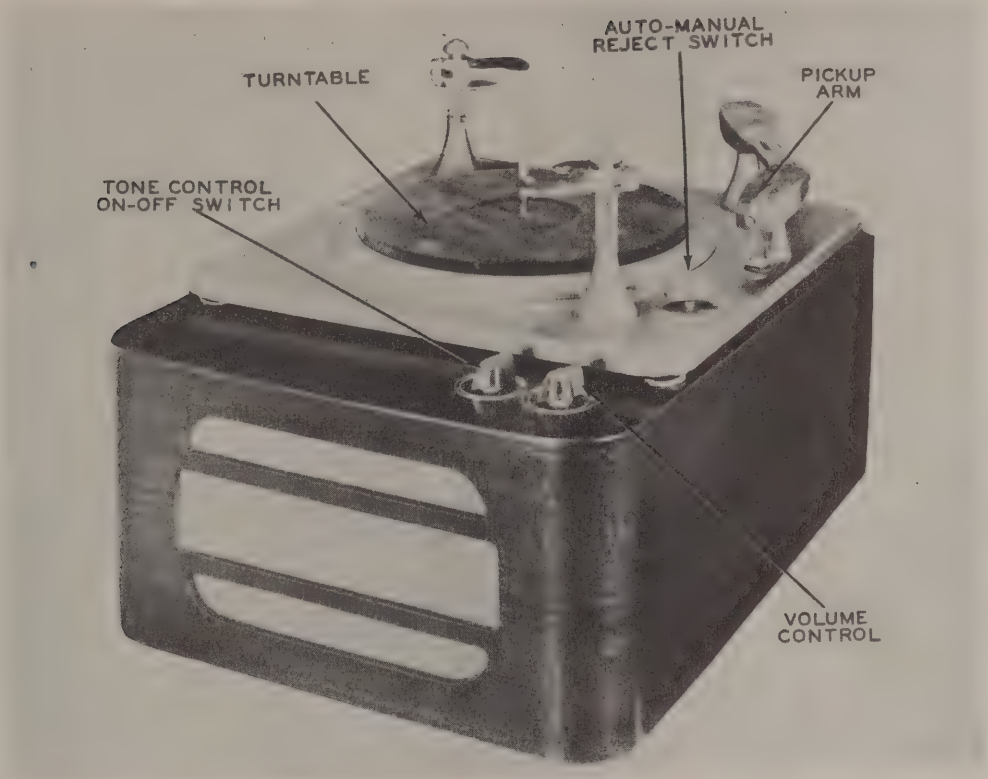
CHASSIS—BOTTOM VIEW





465-10

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.



AUDAR
MODEL P-5

AUDAR
MODEL P-5

AUDAR MODEL P-5

TRADE NAME	Audar Model P-5
MANUFACTURER	Audar Inc., Argos, Indiana
TYPE SET	AC Operated Automatic Record Player with 3 Tube Amplifier and Speaker
TUBES (THREE)	Types, 6SF5AF Amp., 6Y6G Power Output, 6X5GT Rectifier
POWER SUPPLY RATING	117 Volts AC .210 Amps. @ 117 Volts AC

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SF5	0 V	.6V. DC	0 V.	0 V.	87V.DC	0 V.	6V. AC	0 V.	
2	6Y6G	0 V.	0 V.	117V. DC	118V. DC	0 V.	118V. DC	6V. AC	10V. DC	
3	6X5GT	0 V.	0 V.	141V. AC	127V. DC	139V. AC	0 V.	6V. AC	137V. DC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Cap
1	6SF5	0 Ω	3.7K Ω	510K Ω	INF	274K Ω	INF	.1 Ω	0 Ω	
2	6Y6G	INF	0 Ω	52K Ω	54K Ω	430K Ω	54K Ω	.1 Ω	205 Ω	
3	6X5GT	INF.	0 Ω	163 Ω	52K Ω	173 Ω	INF	.1 Ω	52K Ω	

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

1 - DC Voltage measurements are at 20,000 ohms per volt; AC Voltage measured at 1,000 ohms per volt.
2 - Socket connections are shown as bottom views.
3 - Measured values are from socket pin to common negative.
4 - Line voltage maintained at 117 volts for voltage readings.
5 - Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6 - Volume control at maximum, no signal applied for voltage measurements.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		AUDAR PART No.	STANDARD REPLACEMENT		
1	AF Amp.	6SF5	6SF5	6AB	
2	Power Output	6Y6G	6Y6G	7AC	
3	Rectifier	6X5GT	6X5GT	6S	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	AUDAR PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
4A	50	150		TN129	DSB-40+30+20-150	TA-530		EZ42215	Filter - Red
B	20	150				UT-201			" - White
C	20	150							" - "
5	10	50		TC32	M-10-50	TA-510	PRS50-10	BR105	6Y6 Cath. Bypass
6	10	25		TC22	M-10-25	TA-10	PRS25-10	BR102A	Audio Cath. Bypass
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line bypass
8	.02	400		TP423	S-4-02	TC-12	464-02	DT4S2	6Y6 Plate Bypass
9	.05	400		TP426	S-4-02	TC-15	484-05	DT4S5	Audio Coupling
10	.0005	400		TP403	S-6-0005	TC-35	1468-0005	DT6T5	" "

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	AUDAR PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
11A	1 Meg.	1		MR53	D13-137	M-63-Z	Tone Control
B	Shaft			Not Req.	A	Not Req.	Attach to 11A per instructions
C	Switch			M26	41	SW-A	" " " " "
12A	2 Meg.	1		MR55	D13-139	M-66-Z	Volume Control
B	Shaft			Not Req.	A	Not Req.	Attach to 12A per instructions

RESISTORS

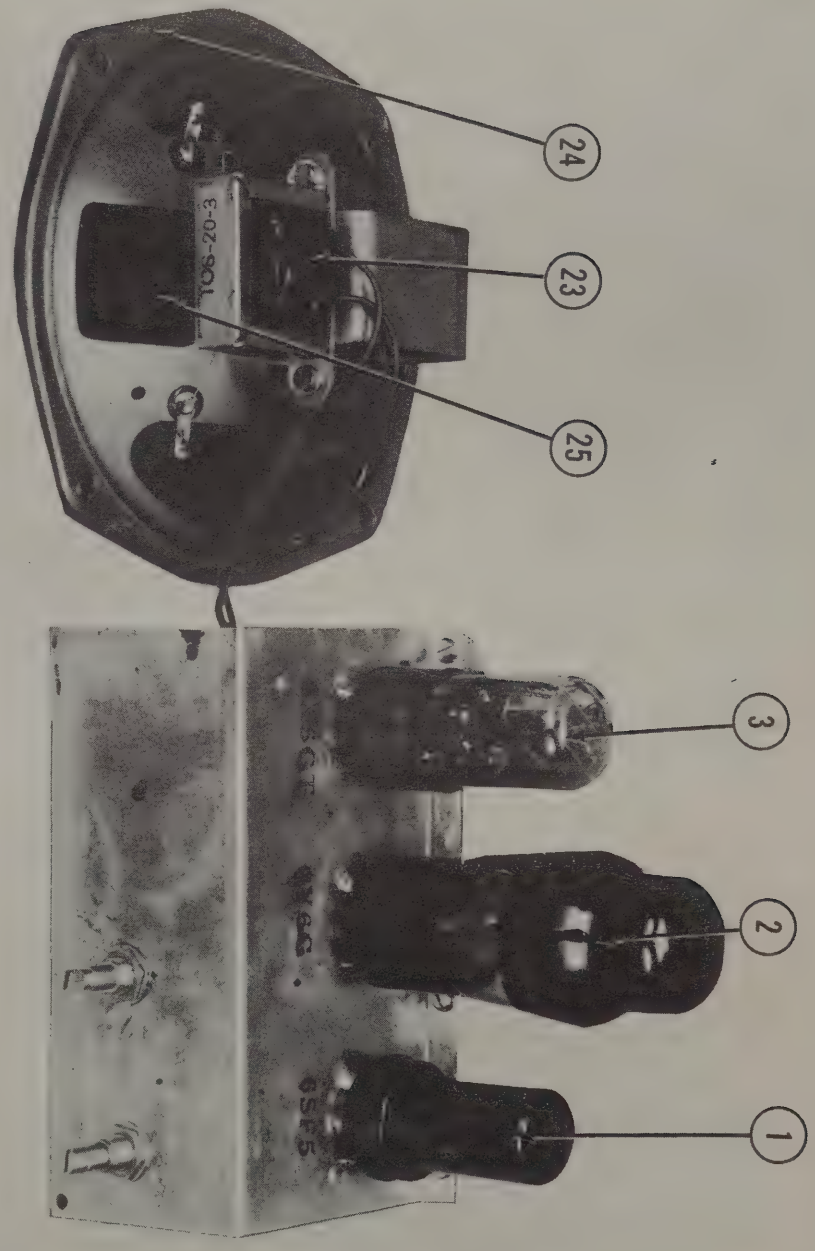
ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	AUDAR PART No.	IRC PART No.	
13	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Series Phono
14	330KΩ	½		BTS-330K	Or.-Or.-Yl. Tone Control Shunt
15	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Tone Compensation
16	4700Ω	½		BTS-4700	Yl.-Vi.-Red 1st AF Cathode
17	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
18	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
19	220Ω	3		2-BW-2-470*	Red-Red-Br. Output Cathode
20	2200Ω	2		BT-2-2200	Red-Red-Red Filter
21	220Ω	3		2-BW-2-470*	Red-Red-Br. "

Connect the two 470Ω resistors in parallel.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	AUDAR PART No.	STANCOR PART No.	THORDASON PART No.	
22	117VAC @ .210A	280VCT @ .046A	6.0VAC @ 1.8A					

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUDAR PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
23	1940Ω	3.1Ω	200Ω	.8Ω		A-3876	T-22645		

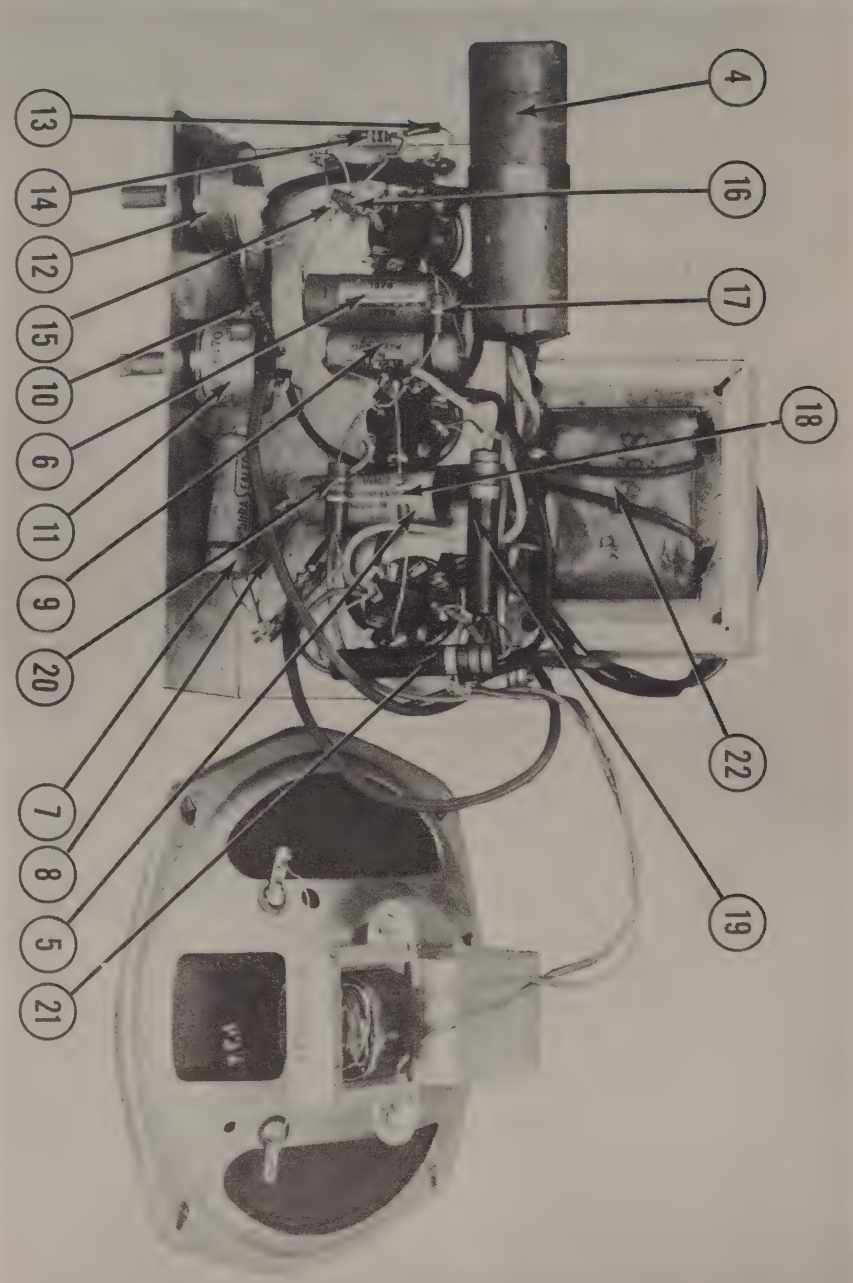
SPEAKER

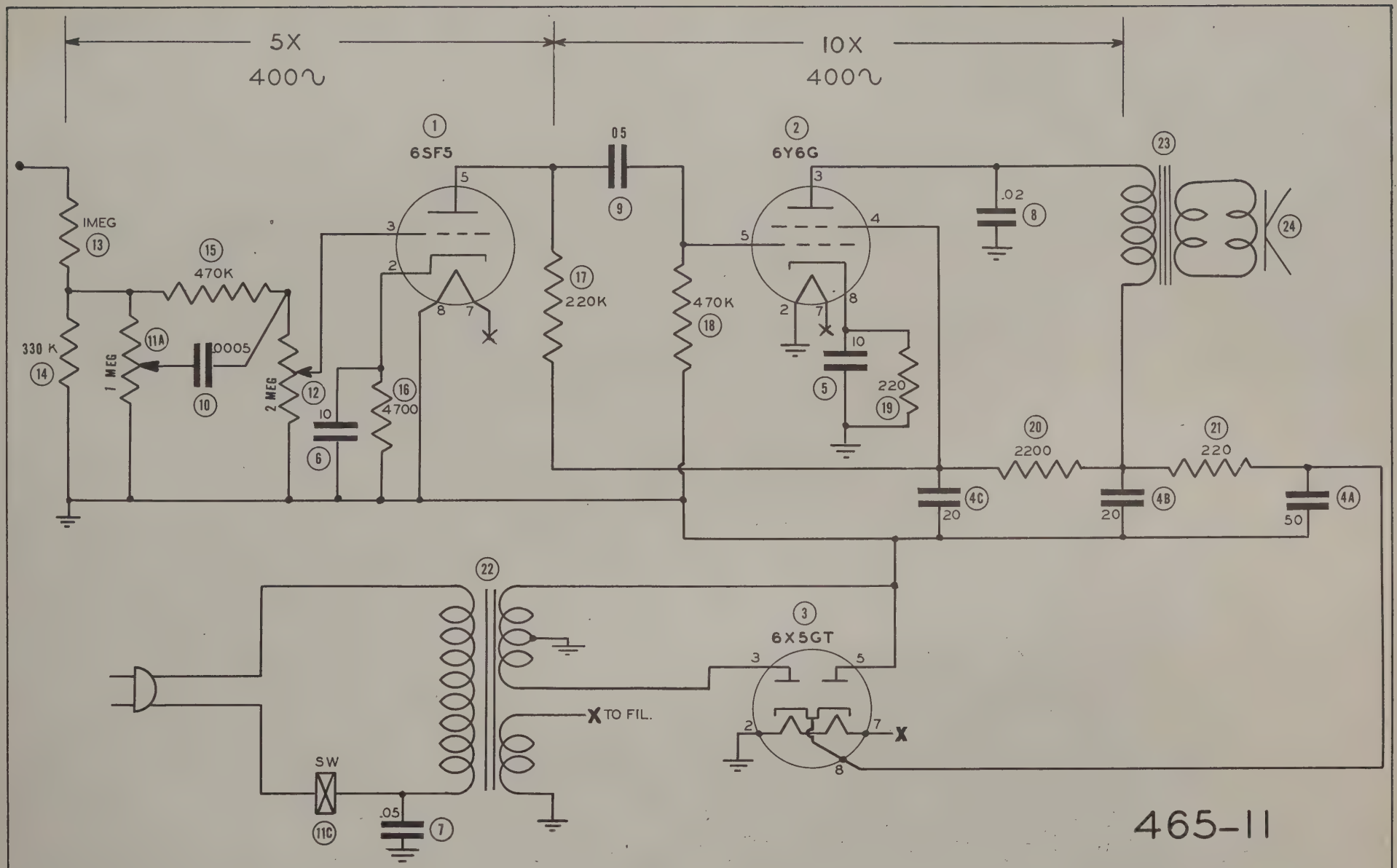
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			AUDAR PART No.	JENSEN PART No.		
24	FIELD PM	VC IMP. 3.1Ω		ST-10G Mod. P6-X		
25	CONE DIA. 6-1/16"	VC DIA. 1/2"	NOT READILY	REPLACEABLE-USE COMPLETE SPEAKER UNIT		

DISASSEMBLY INSTRUCTIONS

1 - Remove 2 bolts holding changer to cabinet.
2 - Remove On-Off-Treble control knob and volume control knob by loosening set screws.
3 - Remove hex nuts holding control shafts.
4 - Slide chassis out in cabinet.
5 - Remove 4 nuts holding speaker and remove speaker.
6 - Unsolder pickup & phono motor leads from chassis.

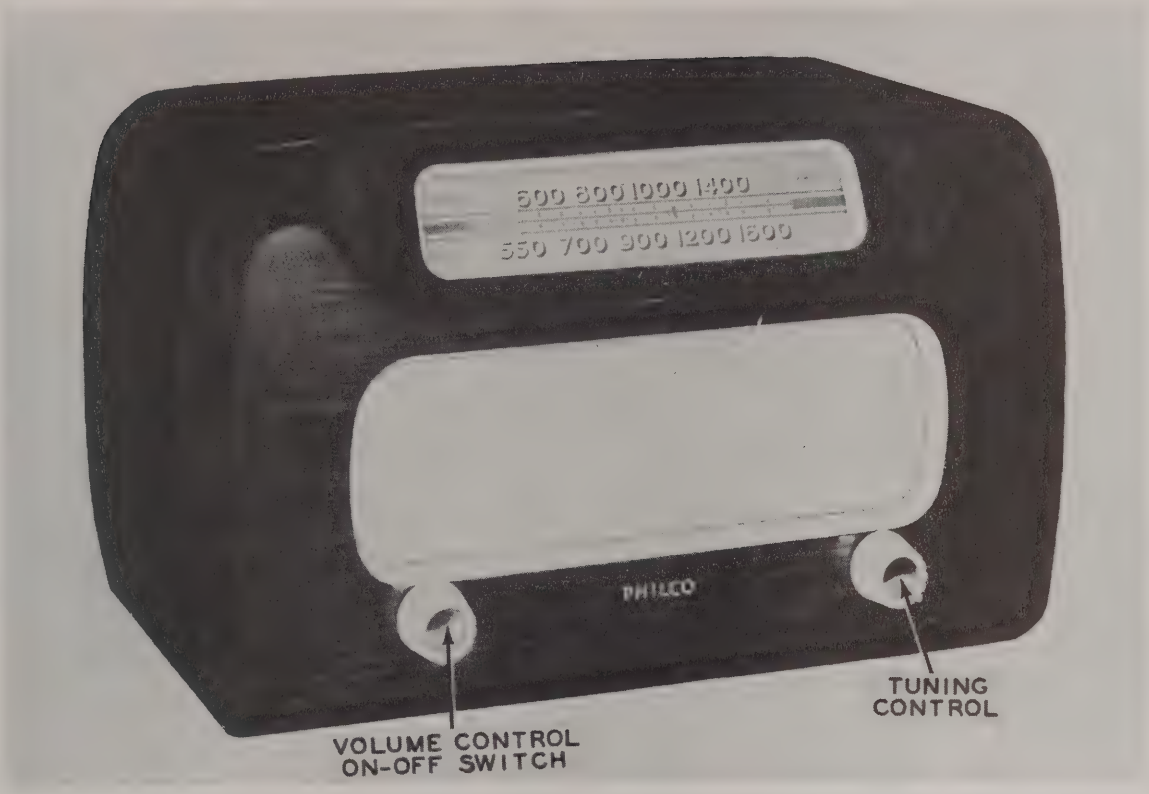
CHASSIS—BOTTOM VIEW





The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

PHILCO
MODELS 46-421, 46-421-1



PHILCO
MODELS 46-421, 46-421-1

PHILCO MODEL 46-421

TRADE NAME	Philco Models 46-421, 46-421-1
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 7C7 RF Amp., 7A8 Converter, 7B7 IF Amp., 7C6 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-120 Volts AC-DC RATING .240 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
100 MMFD	High side to ant. stator section of tuning gang. Low side to B-.	455KC	540KC (gang in full mesh. Set dial pointer to index line on lower left of scale plate reflector)	Across voice coil. (terminal lug and ground on rear of chassis)	A1,A2, A3,A4.	Turn A4 down tight then adjust A1,A2,A3 and A4 in order for maximum output. Use isolation transformer if available. If not, connect isolation capacitor in series with low lead to B-.
"	High side to ant. lead. (disconnect from chassis) Low side to B-.	1600KC	1600KC (first mark on scale plate from right hand end).	"	A5	Adjust for maximum output. Use isolation instructions as given for IF alignment.
"	"	1500KC	1500KC (second mark on scale plate from right hand end).	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: PHILCO PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	7C7	7C7	8V	
2	Converter	7A8	7A8	8U	
3	IF Amp.	7B7	7B7	8V	
4	Det.-AVC-AF	7C6	7C6	8W	
5	Power Output	50L6GT	50L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PHILCO PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	20	150	30-2547	2N509	DHN-2x20-150	TA-220	PRS150-20-20	BRL2215	Filter - Orange
B	20	150							" - Red
8	.04	400	30-4119	TP425	S-6-04	TC-14	484-04	DT4S4	Line Filter
9	.02	400	30-4599	TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass
10	.01	400	61-0120	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.01	400	61-0120	TP421	S-4-01	TC-11	484-01	DT4S1	" "
12	.05	400	30-4518	TP426	S-4-05	TC-15	484-05	DT4S5	Screen Bypass
13	.05	400	30-4518	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
14	.1	200	30-4527	TP428	S-4-1	TC-1	484-.1	DT4P1	Cath. Bypass
15	.2	400	76-1198	TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating Trap*
16	.0015	600	30-4621	TP405	S-6-002	TC-22	684-002	DT6D2	Ant. Coupling
17	250	500	6010245307	MC240	MO.5-325	1FM-325	1468-00025	5W5T25	50L6 Grid Bypass
18	100	500	6010105407	MC235	MO.5-31	1FM-31	1468-0001	5W5T1	RF Coupling
19	10	500	6000105407	MC215	MO.5-41	MS-41	1468-00001	5W5Q1	Fixed Trimmer
20	3		30-1221						RF Plate Bypass

*Wind same number of turns of wire on replacement as on original.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21A	500K	1	33-5469	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 21A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

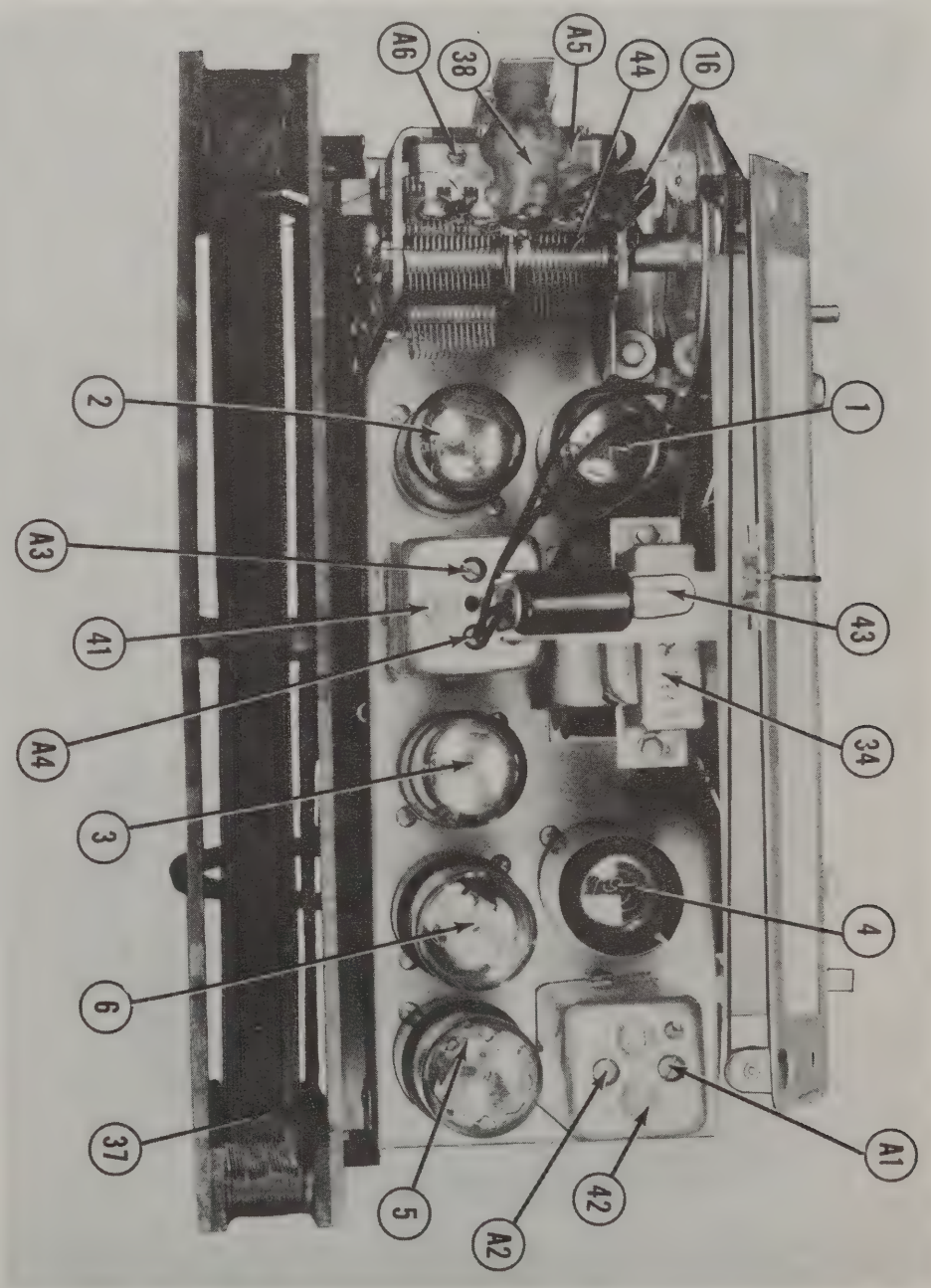
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PHILCO PART No.	IRC PART No.	IDENTIFICATION CODES
22	1 Meg.	½	66-5103340	BTS-1 Meg.	Br.-Blk.-Grn. RF Grid
23	180Ω	1	66-1184360	BW-1-180	Br.-Gray-Br. RF Cathode
24	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. RF Coil Shunt-See Note 1
25A	120KΩ	½	66-3473340	BTS-120K	Br.-Red-Yl. Osc. Grid-used in later production
B	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Osc. Grid-used in early production
26	15KΩ	½	66-3153340	BTS-15K	Br.-Grn.-Or. Screen Dropping
27	3.3 Meg.	½	66-5333340	BTS-3.3 Meg.	Or.-Or.-Grn. 1st AF Grid
28	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
29	470KΩ	½	66-4473340	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
30	470KΩ	½	66-4473340	BTS-470K	Yl.-Vi.-Yl. Output Grid
31	130Ω	½	66-1133340	BW-½-120	Br.-Or.-Br. Output Cathode
32	45Ω	10	33-3432	AB-50	Line Dropping
33	120KΩ	½		BTS-120	Br.-Red-Yl. Line Isolating-See Note 1

Note 1-Not used in all models.

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: PHILCO PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
34	23902	3.922	170Ω	.42Ω	Part of 36-1591	A-3876	T-14S82		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD RES.	VC IMP.				
35	500Ω	3.9Ω	36-1591			
	CONE DIA.	VC DIA.				
36	4"x6"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

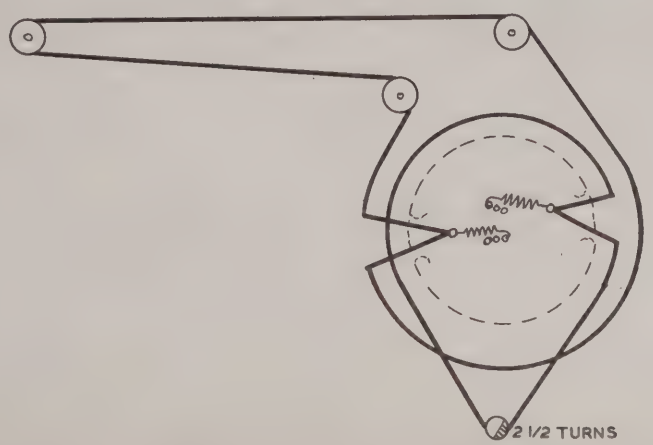
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
37	Loop Ant.	2.1Ω		76-1877		
38	Ant. Coil	32Ω	.8Ω	32-3394		
39	RF Coil	30Ω	29.5Ω	32-3595		
40	Osc. Coil	2.8Ω	6.8Ω	32-3613	14-1040	
41	Input IF	22Ω	22.5Ω	32-3962	16-6658	
42	Output IF	20.2Ω		32-4014	16-6670	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA PHILCO PART No.		INSTALLATION NOTES
43	Bayonet	6-8	0.15	Brown	34-2068		Type 47

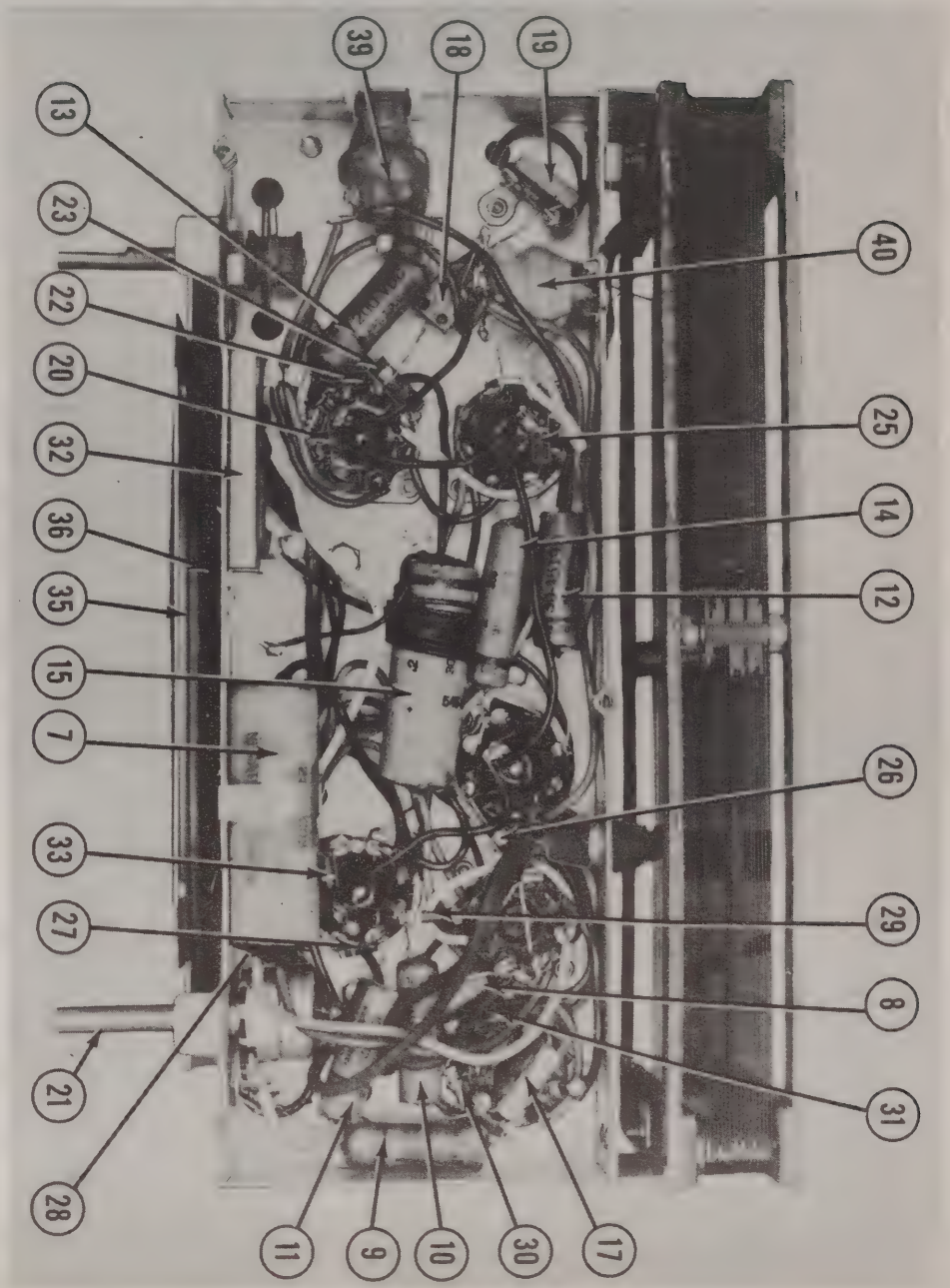
MISCELLANEOUS

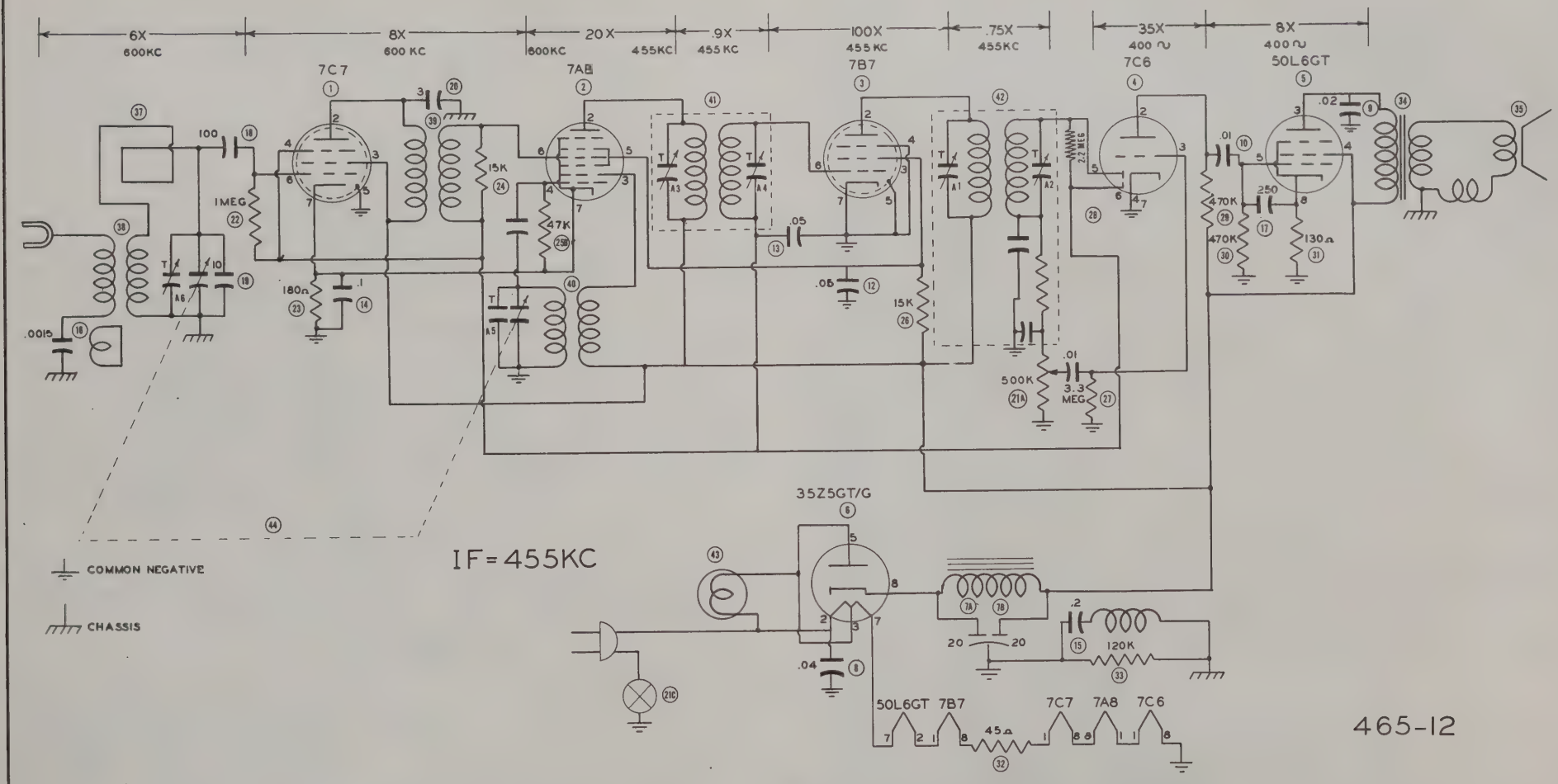
ITEM No.	PART NAME	PHILCO PART No.	NOTES
44	Tuning Cap.	31-2659	2 Gang Variable Cap.
	Knob	54-4227	Model 46-421-walnut
	"	54-4228	" 46-421-1-Ivory
	Dial Scale	27-5849	" 46-421
	" "	27-5845	" 46-421-1
	Pointer	56-2076FCP	Dial
	Cabinet	10630	Model 46-421-walnut
	"	10630A	" 46-421-1-Ivory



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7C7	21 V.AC	87 V.DC	87 V.DC	-.6 V.DC	0 V.	0 V.	1.3 V.DC	14 V.AC
2	7A8	6.5 V.AC	87 V.DC	87 V.DC	-.2 V DC	50 V.DC	-.6 V.DC	1.3 V.DC	14 V.AC
3	7B7	35 V.AC	87 V.DC	50 V.DC	0 V.	0 V.	-.6 V.DC	0 V.	28 V.AC
4	7C6	6.5 V.AC	55 V.DC	-.55 V.DC	0 V.	-.4 V. DC	-.6 V.DC	0 V.	0 V.
5	50L6GT	0 V.	35 V.AC	80 V.DC	87 V.DC	0 V.	0 V.	87 V.AC	57 V.DC
6	35Z5GT	87 V.DC	117 V.AC	113 V.AC	87 V.DC	113 V.AC	87 V.DC	87 V.AC	115 V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	7C7	20.5 Ω	100 KΩ	100 KΩ	3 MEG	0 Ω	4 MEG	175 Ω	13.5 Ω
2	7A8	6 Ω	100 KΩ	100 KΩ	115 KΩ	115 KΩ	3 MEG	175 Ω	13.5 Ω
3	7B7	71 Ω	100 KΩ	115 KΩ	0 Ω	0 Ω	3 MEG	0 Ω	64 Ω
4	7C6	6 Ω	570 KΩ	3.2 MEG	0 Ω	540 KΩ	3 MEG	0 Ω	0 Ω
5	50L6GT	1 N F	71 Ω	100 KΩ	100 KΩ	480 KΩ	0 Ω	119 Ω	140 Ω
6	35Z5GT	100 KΩ	145 Ω	142 Ω	100 KΩ	142 Ω	100 KΩ	119 Ω	100 KΩ

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

PHILCO
MODEL 46-131

PHILCO
MODEL 46-131

PHILCO MODEL 46-131

TRADE NAME	Philco Model 46-131
MANUFACTURER	Philco Corp., Tioga & C Streets, Philadelphia, Pa.
TYPE SET	Battery Operated Superheterodyne Receiver
TUBES (FOUR)	Types, 1LA6 Converter, 1LN5 IF Amp., 1LH4 Det.-AVC-AF, 1A5GT Power Output.
POWER SUPPLY	90 Volt "B" Supply & 1.5 Volt "A" Supply from Battery Pack-Philco Type P-60B-6L or equivalent.
TUNING RANGE—BROADCAST	540-1720KC RATING 7.7MA @ 90V DC & .210 Amps. @ 1.5V DC

ALIGNMENT INSTRUCTIONS

Volume control at three-fourths maximum volume and output of signal generator no higher than is necessary to give output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
100MMFD	High side to ant. stator section of tuning gang. Low side to chassis.	455KC	540KC Tuning gang in full mesh.	Across voice coil.	A1,A2, A3.	Turn A3 down tight then adjust A1, A2 and A3 in order for maximum output. Make sure that dial pointer is set to left index mark (first small hole 3-3/4" from left end of scale plate reflector.)
"	High side to ant. lead. Low side to chassis.	1700KC	1700KC (first small hole 4-1/8 from right end of scale plate reflector)	"	A4	Adjust for maximum output.
"	"	1500KC	Tune in 1500 KC signal.	"	A5	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		PHILCO PART No.	STANDARD REPLACEMENT		
1	Converter	1LA6	1LA6	7AK	
2	IF Amp.	1LN5	1LN5	7AO	
3	Det.-AVC-AF	1LH4	1LH4	5AG	
4	Power Output	1A5GT	1A5GT	6X	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	PHILCO PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
5	10	150	30-2540	TC42	M-10-150	UT-121	PRS150-12	BR1215	RF Bypass Pwr. Supp.
6	.004	600	30-4623	TP407	S-6-004	TC-24	684-004	DT6D4	Audio Coupling
7	.0015	600	30-4621	TP404	S-6-001	TC-21	684-001	DT6D1	" "
8	.05	400	30-4518	TP426	S-4-05	TC-15	484-05	DT4S5	Conv. Screen Bypass
9	.006	600	30-4504	TP409	S-6-006	TC-26	684-006	DT6D6	Fixed Padder
10	.05	400	30-4518	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
11	500	500		MC245	MO.5-35	1FM-35	1468-0005	5W5T5	1A5 Plate Bypass
12	100	500	6010105407	MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Audio Plate Bypass
13	100	500	6010105407	MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
14	5	500		MC205	MO.5-55	MS-55	1468-000005	5W5V5	Ant. Coupling

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	PHILCO PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
15A	1 Meg.	1	33-5493	MR53	D13-137	M-63-4	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 15A per instructions.
C	Switch		" "	M27	42	SW-A2	" " " " "

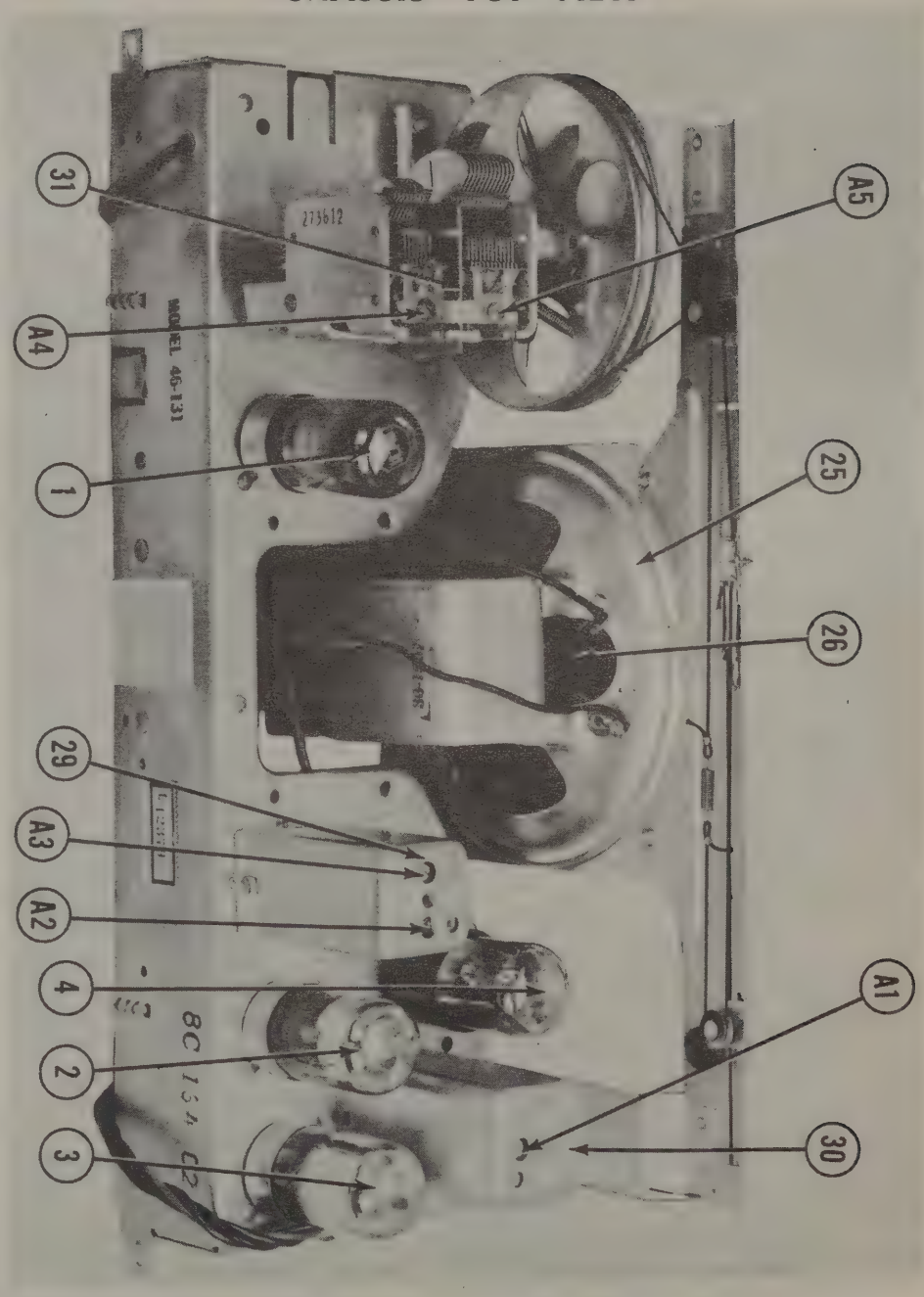
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PHILCO PART No.	IRC PART No.	
16	4.7 Meg.	½	66-5473340	BTS-4.7 Meg.	Yl.-Vl.-Grn. AVC Network
17	220KΩ	½	66-4223340	BTS-220K	Red-Red-Yl. Osc. Grid
18	68KΩ	½	66-3683340	BTS-68K	Blue-Gray-Or. Mixer Screen Dropping
19	10 Meg.	½	66-6101330	BTS-10 Meg.	Br.-Blk.-Blue AVC Network
20	4.7 Meg.	½	66-5473340	BTS-4.7 Meg.	Yl.-Vl.-Grn. 1st AF Grid
21	1 Meg.	½	66-5103340	BTS-1 Meg.	Br.-Blk.-Grn. 1st AF Plate Load
22	2.2 Meg.	½	66-5223340	BTS-2.2 Meg.	Red-Red-Grn. Output Grid
23	820Ω	½	66-1823340	BTS-820	Gray-Red-Br. Bias

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PHILCO PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
24	25000Ω	3.3Ω	850Ω	.35Ω	32-8240	A-3857	T-14S83		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

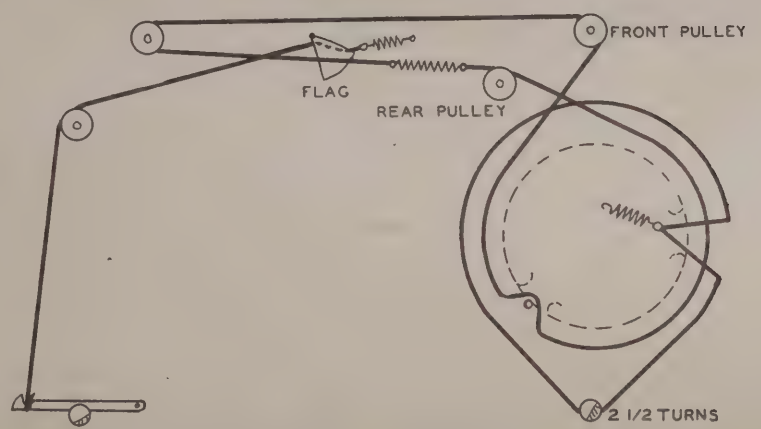
ITEM No.	RATINGS		REPLACEMENT DATA PHILCO PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
25	PM	3.3Ω	36-1507			
	CONE DIA.	VC DIA.				
26	5"	1/2"	NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA PHILCO PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
27	Ant. Coil	1Ω	2.4Ω	32-3919	14-1026	
28	Osc. "	2Ω	7.5Ω	32-4044	14-1040	
29	Input IF	29Ω	30Ω	32-3966	16-6658	
30	Output IF	98Ω		32-3897	16-6670	

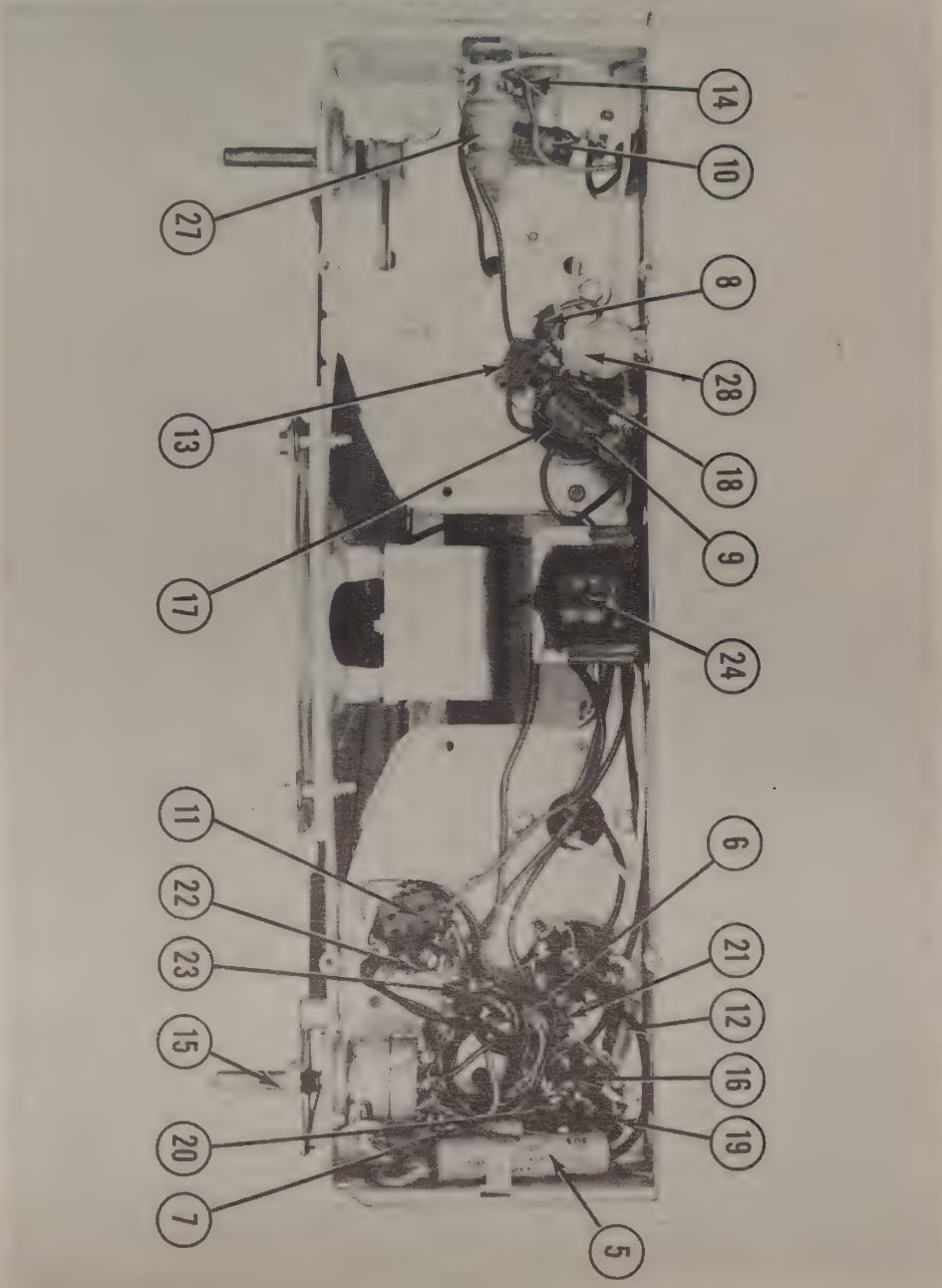
MISCELLANEOUS

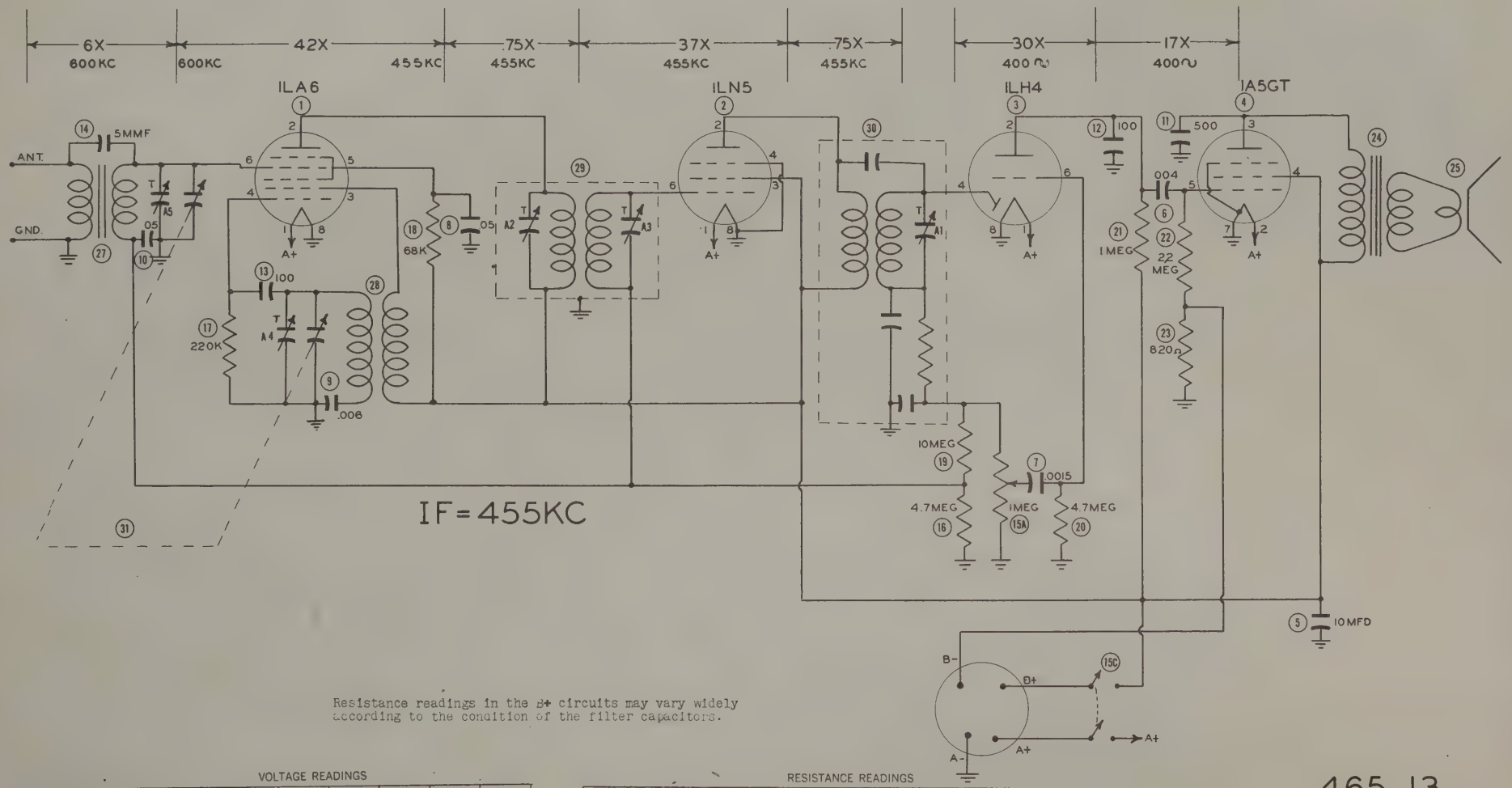
ITEM No.	PART NAME	PHILCO PART No.	NOTES
31	Tuning Cap.	31-2641	2 Gang Var. Cap.
	Knob	54-4101	
	Cable	41-3708	Battery Assembly
	Pointer	56-2159FCP	
	Dial Scale	27-5842	Glass
	Transfer Lever	76-1655	Assembly



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	1LA6	1.57V.DC	87V.DC	87V.DC	-2V.DC	42V.DC	0V.	87V.DC	0V.
2	1LN5	1.57V.DC	87V.DC	87V.DC	0V.	0V.	0V.	0V.	0V.
3	1LH4	1.57V.DC	52V.DC	0V.	-.07V.DC	-.05V.DC	0V.	0V.	0V.
4	1A5GT	0V.	1.57V.DC	85V.DC	87V.DC	-2V.DC	-6.4V.DC	0V.	0V.

RESISTANCE READINGS

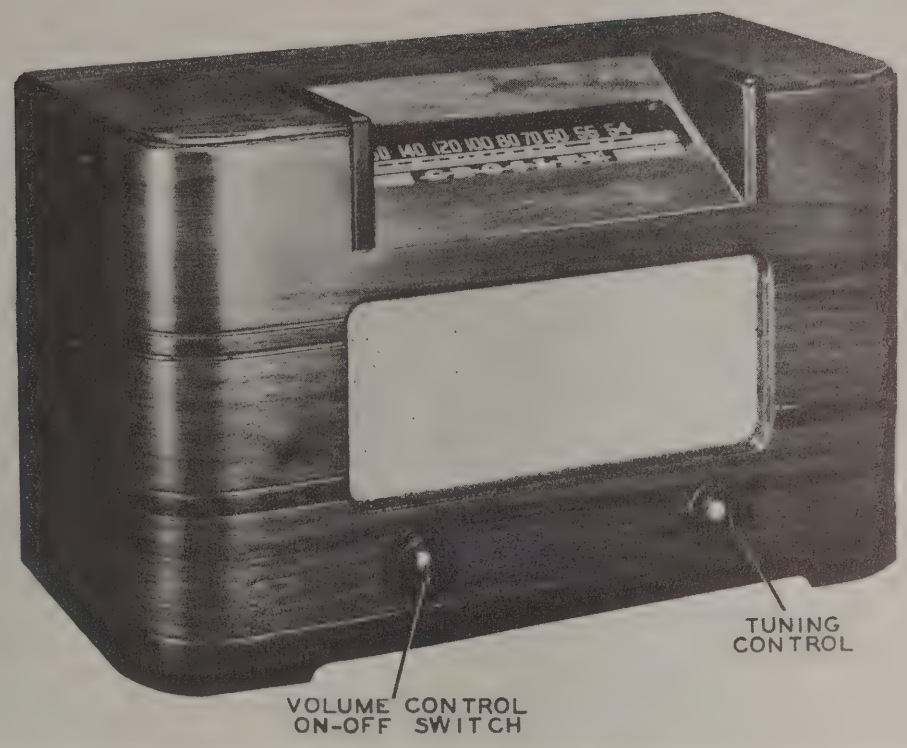
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	1LA6	*	70 KΩ	70 KΩ	220KΩ	155 KΩ	3.2MEG	68KΩ	*
2	1LN5	*	70 KΩ	70 KΩ	0Ω	0Ω	3.2MEG	3.2MEG	*
3	1LH4	*	1.2 MEG	3.2MEG	980KΩ	950KΩ	5 MEG	INF	*
4	1A5GT	INF	*	70 KΩ	70KΩ	2.2 MEG	780Ω	*	INF

* DO NOT USE OHMMETER TO CHECK FILAMENT CONTINUITY.

465-13

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



CROSLEY
MODEL 56TJ

CROSLEY
MODEL 56TJ

CROSLEY MODEL 56TJ

TRADE NAME	Crosley Model 56TJ
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7GT Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING .220 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

Use isolating transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1	High side to pin #5 of 6SA7. Low side to chassis.	455KC	High freq.end of dial.(Fully counter-clockwise)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ant. Low side to chassis.	1620KC	"	"	A5	" " " "
"	"	1400KC	1400KC	"	A6	" " " "
"	"	600KC	Tune for maximum output.	"	32	Rock dial and adjust for maximum output. Recheck A5 and A6.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: CROSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: CROSLEY PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150	KIB-136769	2N520	DSB-2x50-150/20-25	TA-530	PRSA150-40-40	BRD3515	Filter - Red
B	30	150							" - Blue
C	10	25		TC22		TA-25	PRS25-10	BR102A	Bypass - Green
7	.05	200	39001-65	TP426	S-4-05	TC-15	484-.05	DT4S5	Line Bypass
8	.2	200	39001-105	TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating
9	.022	200	G39001-63	TP423	S-4-02	TC-12	484-.02	DT4S2	50B5 Plate Bypass
10	.022	200	39001-63	TP423	S-4-02	TC-12	484-.02	DT4S2	Audio Coupling
11	.0033	600	39001-10	TP406	S-6-003	TC-23	684-.003	DT6D3	Audio Coupling
12	.05	200	39001-65	TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
13	.0033	600	39001-10	TP406	S-6-003	TC-23	684-.003	DT6D3	Antenna Coupling
14	220	500		MC237	MO.5-32	1FM-32	1468-.0002	5W5T2	Audio Plate Bypass
15	50	500		MC225	MO.5-45	1FM-45	1468-.00005	5W5Q5	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	1 Meg.	1	B135127-A	MK402	D13-137	AM-63-2	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 20A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

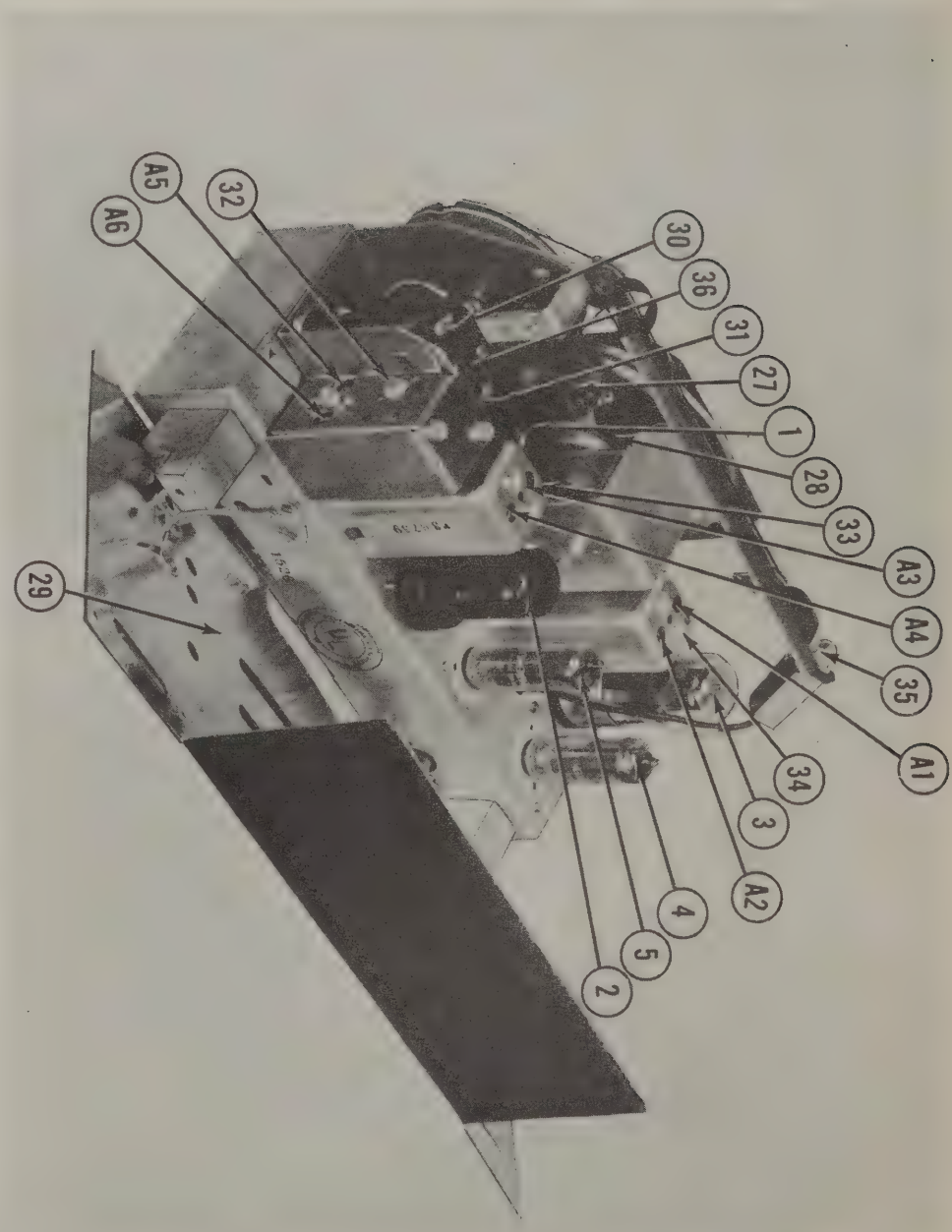
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: CROSLEY PART No.	IRC PART No.	IDENTIFICATION CODES
17	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid Leak
18	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue AVC Network
19	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
20	5 Meg.	½		BTS-4.7 Meg.	Grn.-Blk.-Grn. 1st AF Grid
21	500KΩ	½		BTS-470K	Grn.-Blk.-Yl. 1st AF Plate Load
22	470KΩ	½		BTS-470K	Yl.-Vl.-Yl. Output Grid Load
23	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
24	1200Ω	1		BTA-1200	Br.-Red-Red Filter
25	150Ω	½		BW-½-150	Br.-Grn.-Br. Pilot Light Shunt
37	40Ω	½		BW-½-47	Yl.-Blk.-Blk. Surge Limiter
38	250KΩ	½		BTS-220K	Red-Grn.-Yl. Line Isolating

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: CROSLEY PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
26	2300Ω	4.2Ω	150Ω	.5Ω		A-3876	T14S82		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA CROSLEY PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
27	PM	4.2Ω		ST-1131		†Fabricate new mounting bracket.
	CONE DIA.	VC DIA.				
28	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

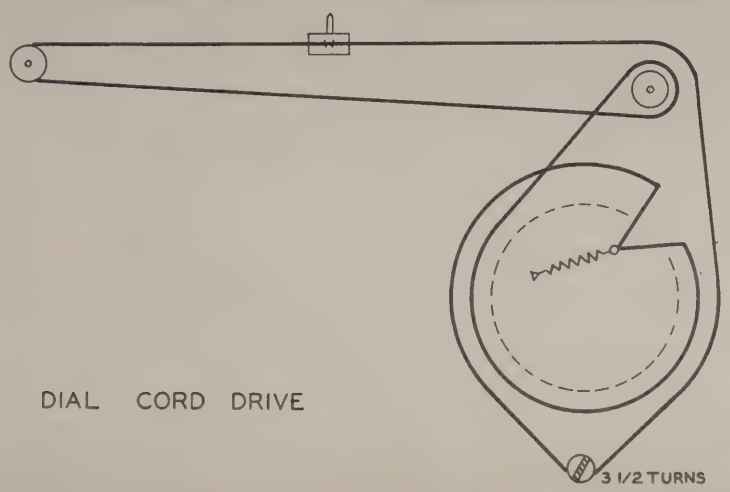
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA CROSLEY PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
29	Ant. Plate					
30	Ant. Coil		8Ω			Items 30,31 ganged and slug tuned
31	Osc. Coil		5Ω			
32	Osc. Pad		5Ω			
33	Input IF	11.3Ω	21.8Ω		16-6658	
34	Output IF	23Ω			16-6670	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA CROSLEY PART No.	REPLACEMENT DATA	INSTALLATION NOTES
35	Bayonet	6-8	0.15	Brown			Type 47

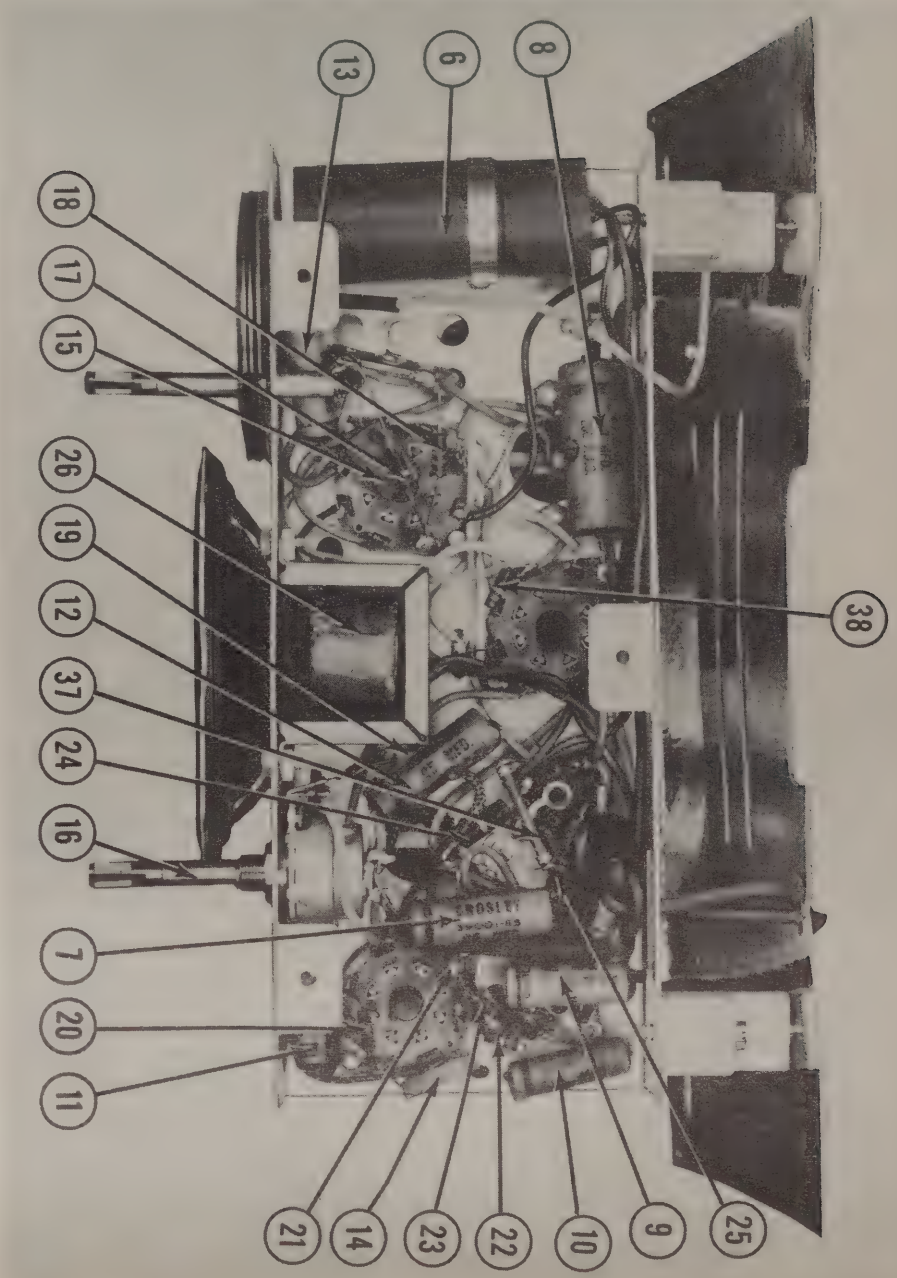
MISCELLANEOUS

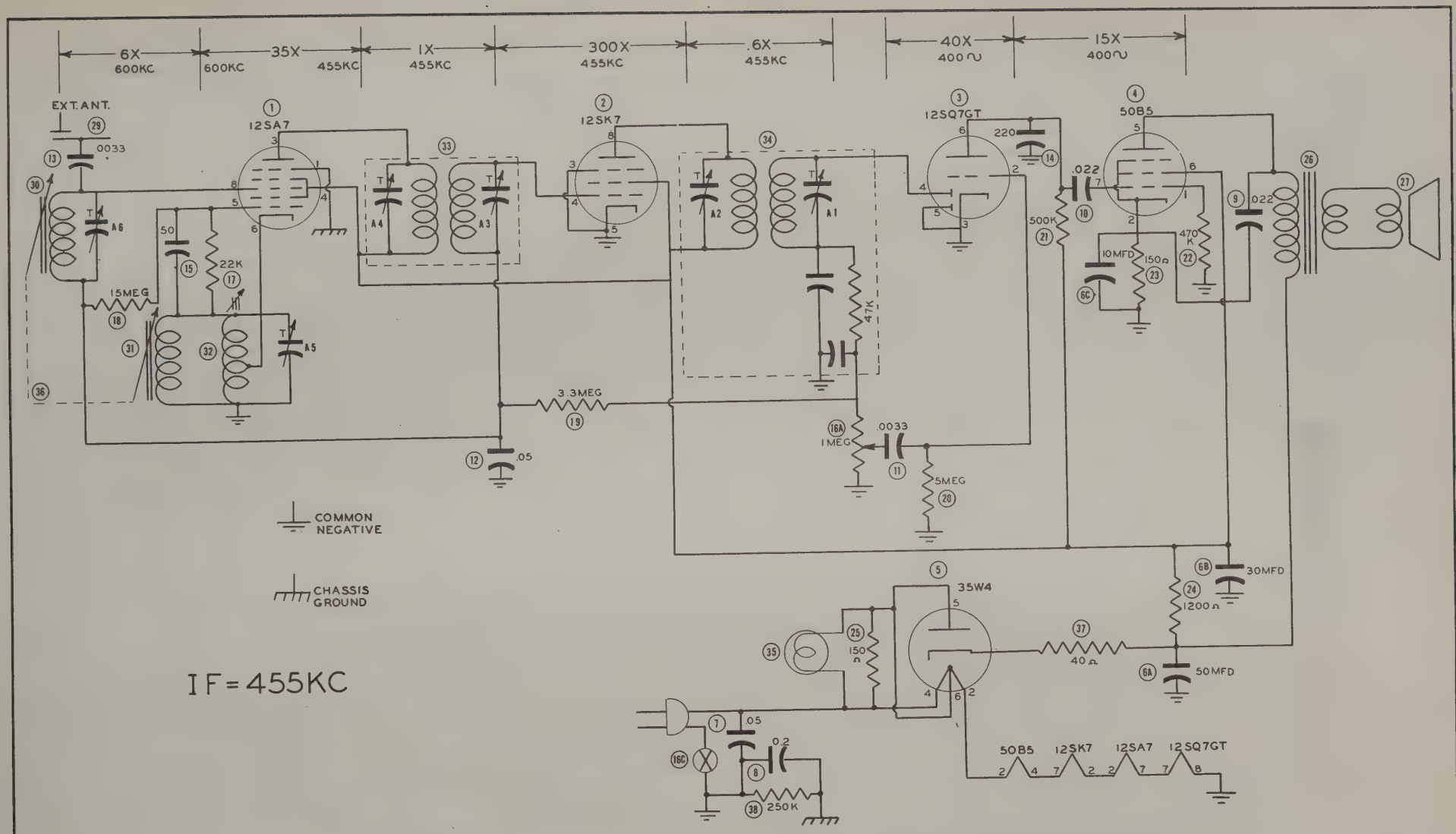
ITEM No.	PART NAME	CROSLEY PART No.	NOTES
36	Tuning Assby.		Tuning mechanism for coils 31&32



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	-1VDC	24.5VAC	85V.DC	85V.DC	-.25V.DC	0V.	12.8VAC	-.6V.DC
2	12SK7	-1VDC	24.5VAC	0V.	-.6V.DC	0V.	85V.DC	35.8VAC	85V.DC
3	12SQ7GT	-1VDC	-.55VDC	0V.	-.4V.DC	0V.	47V.DC	12.8VAC	0V.
4	50B5	0V.	5.1V.DC	88 V.AC	35.8VAC	108V.DC	85V.DC	0V.	
5	35W4	112V.DC	-.6V.DC	88 V.AC	117V.AC	113V.AC	113V.AC	115 V.DC	

RESISTANCE READINGS

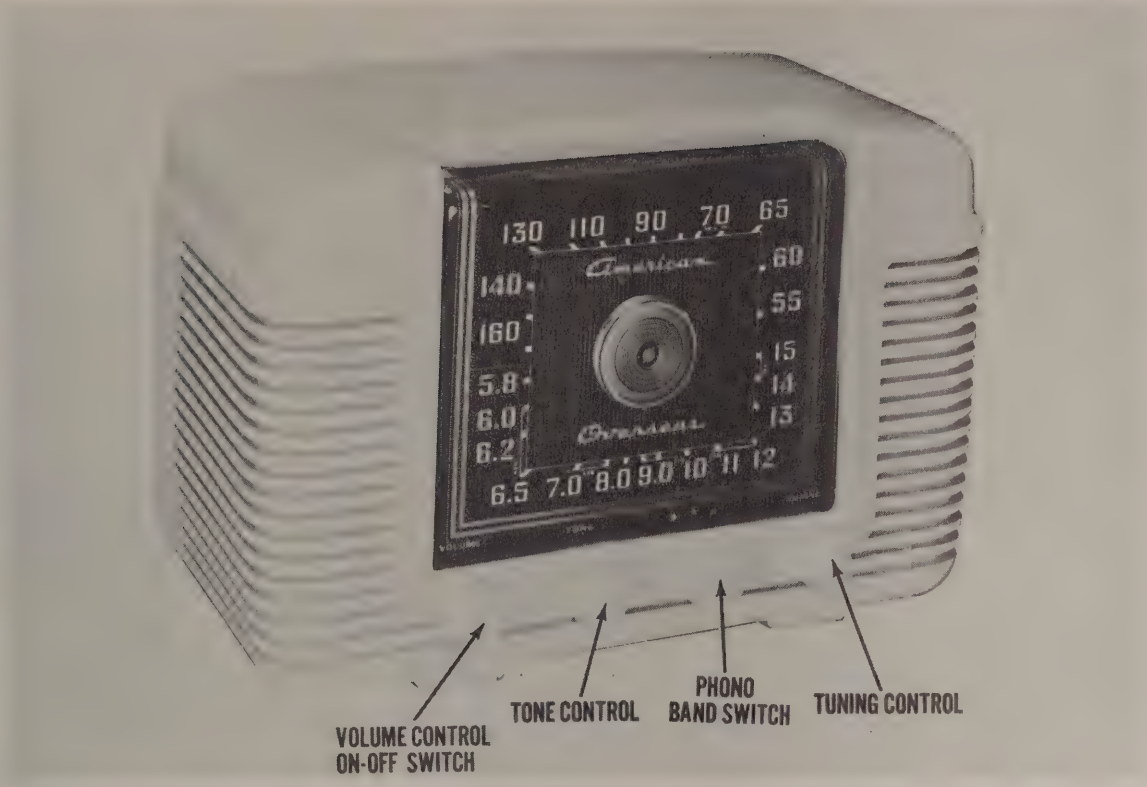
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	240K∩	23.5 ∩	78K∩	78K∩	19K ∩	.5 ∩	12.5 ∩	2.8MEG
2	12SK7	240 K∩	23.5 ∩	0 ∩	2.8MEG	0 ∩	78K ∩	34 ∩	78K∩
3	12SQ7GT	240K∩	5.5 MEG	0 ∩	825K∩	0 ∩	578K∩	12.5 ∩	0 ∩
4	50B5	420K∩	160 ∩	83 ∩	34 ∩	78K∩	78K ∩	420K∩	
5	35W4	78K∩	2.8MEG	83 ∩	111 ∩	108 ∩	108 ∩	78K∩	

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-14

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



CROSLEY
MODELS 66TA, 66TW, 66TC

CROSLEY
MODELS 66TA, 66TW, 66TC

CROSLEY MODEL 66TW

TRADE NAME	Crosley Models 66TA, 66TW, 66TC
MANUFACTURER	Crosley Corp., 1329 Arlington St., Cincinnati, Ohio
TYPE SET	AC Operated 2 Band Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 6SK7 RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6SQ7GT Det.-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	110-120 Volts AC — RATING .55 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1600KC — **SHORT WAVE** 5.8 - 15MC

ALIGNMENT INSTRUCTIONS

To set pointer turn variable completely closed and set pointer to the reference line at the end of the dial scale. Care should be taken that the short wave oscillator trimmer (A6) is not aligned on an image. To check, tune in the signal generator freq., then increase the generator output and tune in the image. The image freq. should be weaker than the fundamental and 910KC lower on the receiver dial. If the image cannot be tuned in, the receiver has been adjusted to the wrong peak. Tone control in treble position. Volume control in maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
200 MMF	High side to external antenna terminal. Low side to chassis.	455KC	A	High freq. end of dial. (Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
"	"	"	"	"	"	A5	Adjust for minimum output
400 ohms	"	15.3MC	0	"	"	A6	Adjust for maximum output
"	"	15MC	"	15 MC	"	A7	" " " "
200 MMF	"	1620KC	A	High freq. end of dial (Variable fully open).	"	A8	" " " "
"	"	1400KC	"	1400KC	"	A9	" " " "
"	"	600KC	"	600KC	"	A10	Rock dial adjust for maximum output. Recheck A8 at 1620KC and A9 at 1400KC.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		CROSLEY PART No.	STANDARD REPLACEMENT		
1	RF Amp.	6SK7	6SK7	8N	
2	Converter	6SA7	6SA7	8R	
3	IF Amp.	6SK7	6SK7	8N	
4	Det.-AVC-AF	6SQ7GT	6SQ7GT	8Q	
5	Power Output	6V6GT	6V6GT	7AC	
6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	CROSLEY PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
7A	20	360	D-132807	FP444	DY-4x20-450	EL-442	AF444J4A	UP9DJ56	Filter - Red
B	20	275							" - Blue
C	20	245							" - Green
D	20	25							Bypass - Yellow
8	.01	400	W-30805	TP421	S-4-01	TC-11	484-01	DT4S1	Line Bypass
9	.005	600	39001-11	TP408	S-6-005	TC-25	684-005	DT6D5	6V6 Plate Bypass
10	.01	400	39001-37	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.005	600	39001-11	TP408	S-6-005	TC-25	684-005	DT6D5	Tone Compensation
12	.005	600	39001-11	TP408	S-6-005	TC-25	684-005	DT6D5	Audio Coupling
13	.01	200	39001-61	TP421	S-4-01	TC-11	484-01	DT4S1	Tone Compensation
14	.05	200	39001-65	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
15	.05	400	39001-41	TP426	S-4-05	TC-15	484-05	DT4S5	Screen Bypass
16	220	500	39004-9	MC237	M0.5-32	1FM-32	1468-0002	5W5T2	6V6 Grid Bypass
17	50	500	39004-5	MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	RF Bypass Vol. Cont.
18	50	500	39004-5	MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Fixed Trimmer
19	220	500	39004-9	MC237	M0.5-32	1FM-32	1468-0002	5W5T2	RF Coupling
20	580	300	GC21068545						Fixed Padder
21	220	500	39004-9	MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Osc. Grid Capacitor
22	220	500	39004-9	MC237	M0.5-32	1FM-32	1468-0002	5W5T2	RF Coupling

CONTROLS

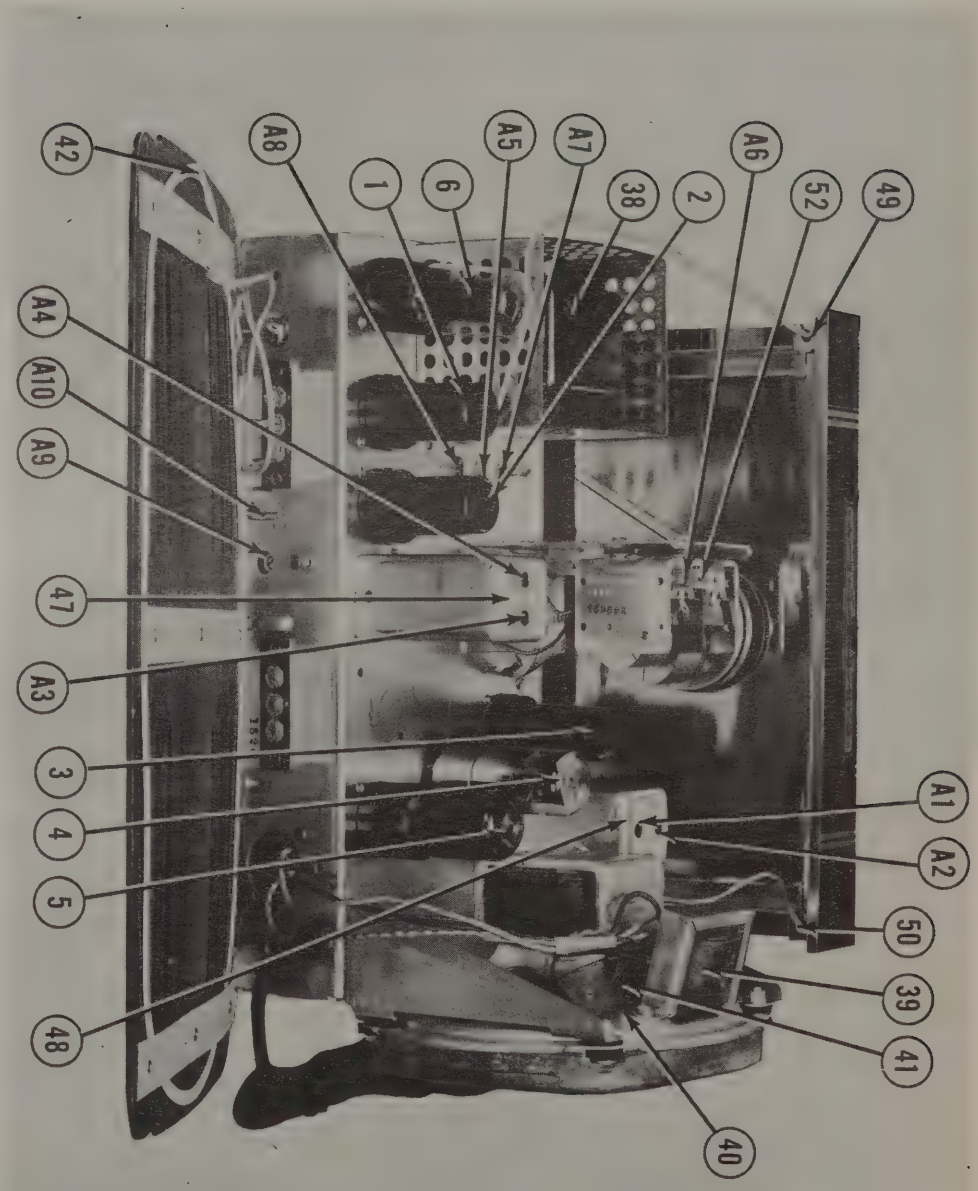
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	CROSLEY PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
23A	1 Meg.	1	B-135859	TM240	D13-137X	T-98	Volume Control
B	Shaft		Not Req.	S51	A	Not Req.	Attach to 23A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
24A	3 Meg.	1	B-135651	MR57*	D13-140*	M-67-Z*	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 24A per instructions

*Use lug furnished with control to ground center terminal.

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	CROSLEY PART No.	IRC PART No.	
25	3300Ω	½	39281-16	BTS-3300	Or.-Or.-Red RF Plate Load
26	22KΩ	½	39281-21	BTS-22K	Red-Red-Or. Osc. Grid
27	12KΩ	2	39016-38	BT-2-12K	Br.-Red-Or. Converter Screen Dropping
28	2.2 Meg.	½	39281-33	BTS-2.2 Meg	Red-Red-Grn. AVC Network
29	1000Ω	1	39040-13	BTA-1000	Br.-Blk.-Red Decoupling
30	2.2 Meg.	½	39281-33	BTS-2.2 Meg	Red-Red-Grn. AVC Network
31	100KΩ	½	39281-25	BTS-100K	Br.-Blk.-Yl. IF Filter
32	33KΩ	½	39281-22	BTS-33K	Or.-Or.-Or. Tone Compensation
33	5 Meg.	½	39281-35	BTS-4.7 Meg	Grn.-Blk.-Grn. 1st AF Grid
34	330KΩ	½	39281-28	BTS-330K	Or.-Or.-Yl. 1st AF Plate Load
35	470KΩ	½	39281-29	BTS-470K	Yl.-Vi.-Yl. Output Grid
36	330Ω	1	39015-19	BTA-330	Or.-Or.-Br. Output Cathode
37	22KΩ	½	39281-21	BTS-22K	Red-Red-Or. Converter Grid

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	CROSLEY PART No.	STANCOR PART No.	THORDARSON PART No.	
38	117VAC @ .55A	510VCT @ .060A	5.0 VAC @ 1.9A	6.3VAC @ 1.9A	B-134625	P-6120	T-13R17	

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		CROSLEY PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
39	3000Ω	3.4Ω	350Ω	.4Ω	B-137237	A-3877†	T-22S87		†Drill new mounting holes.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			CROSLEY PART No.	JENSEN PART No.		
	FIELD RES.	VC IMP.				
40	920Ω	3.4Ω	C-135374	ST-567		
	CONE DIA.	VC DIA.				
41	6"	3/4"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	CROSLEY PART No.	MEISSNER PART No.	
42	Loop Ant.		.5Ω	AC134673		Used on models 66TA, 66TW
A	" "			AC134672		Used on model 66TC
43	BC Ant.Coil	63Ω	3Ω	AW135910		
44	SW " "	.3Ω	.2Ω	AW135909	14-1044	
45A	Peaking "	33Ω		AW135907		Items 45A & 45B wound on same form
B	Wave Trap "	3Ω		AW135907		
46A	BC Osc. "		6Ω	AW135908		Items 46A & 46B wound on same form
B	SW " "		.1Ω	AW135908		
47	Input IF	22.3Ω	19.5Ω	AW134065	16-6658	
48	Output IF	27Ω		AW134158	16-6660	

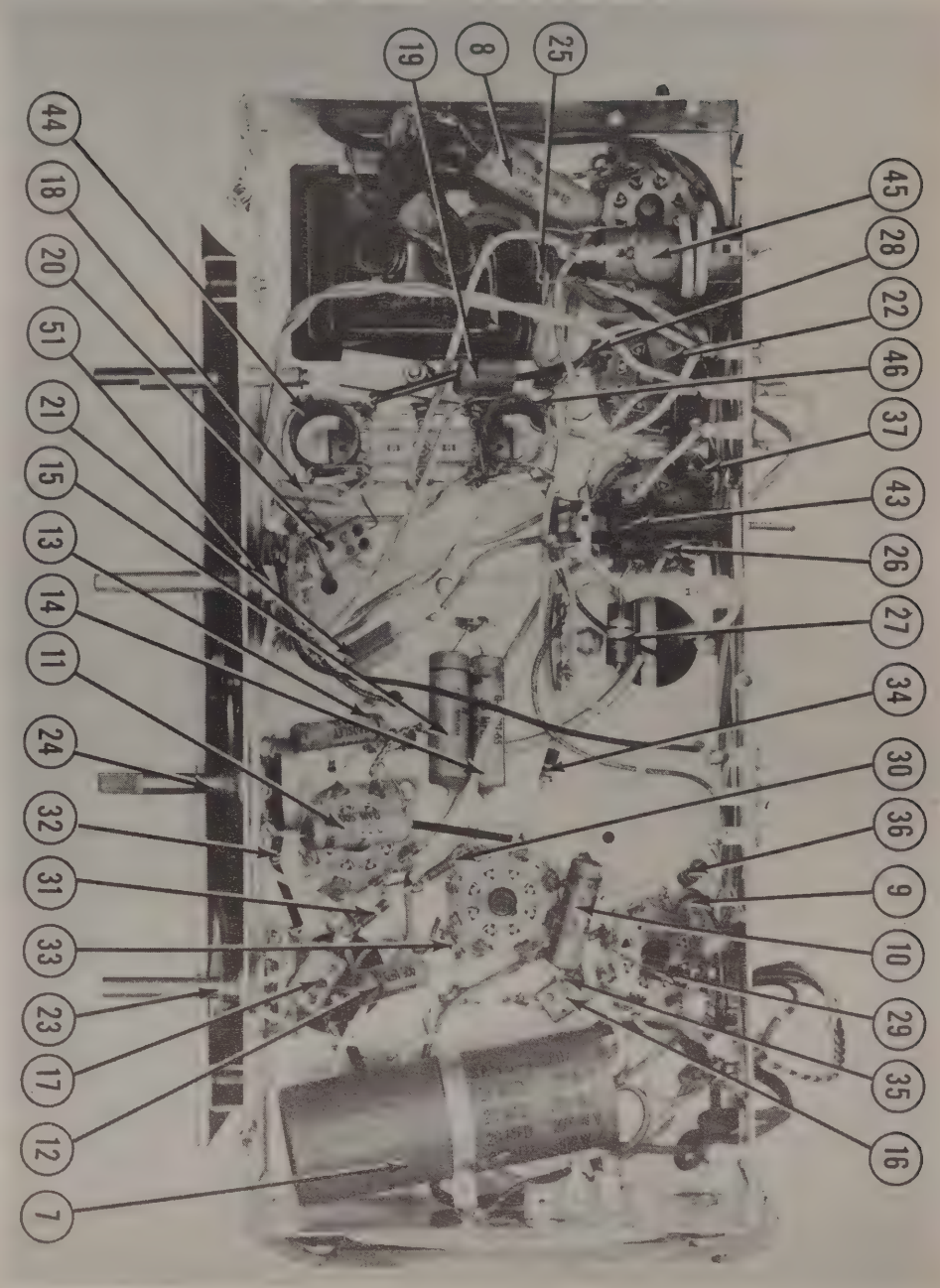
DIAL LIGHT

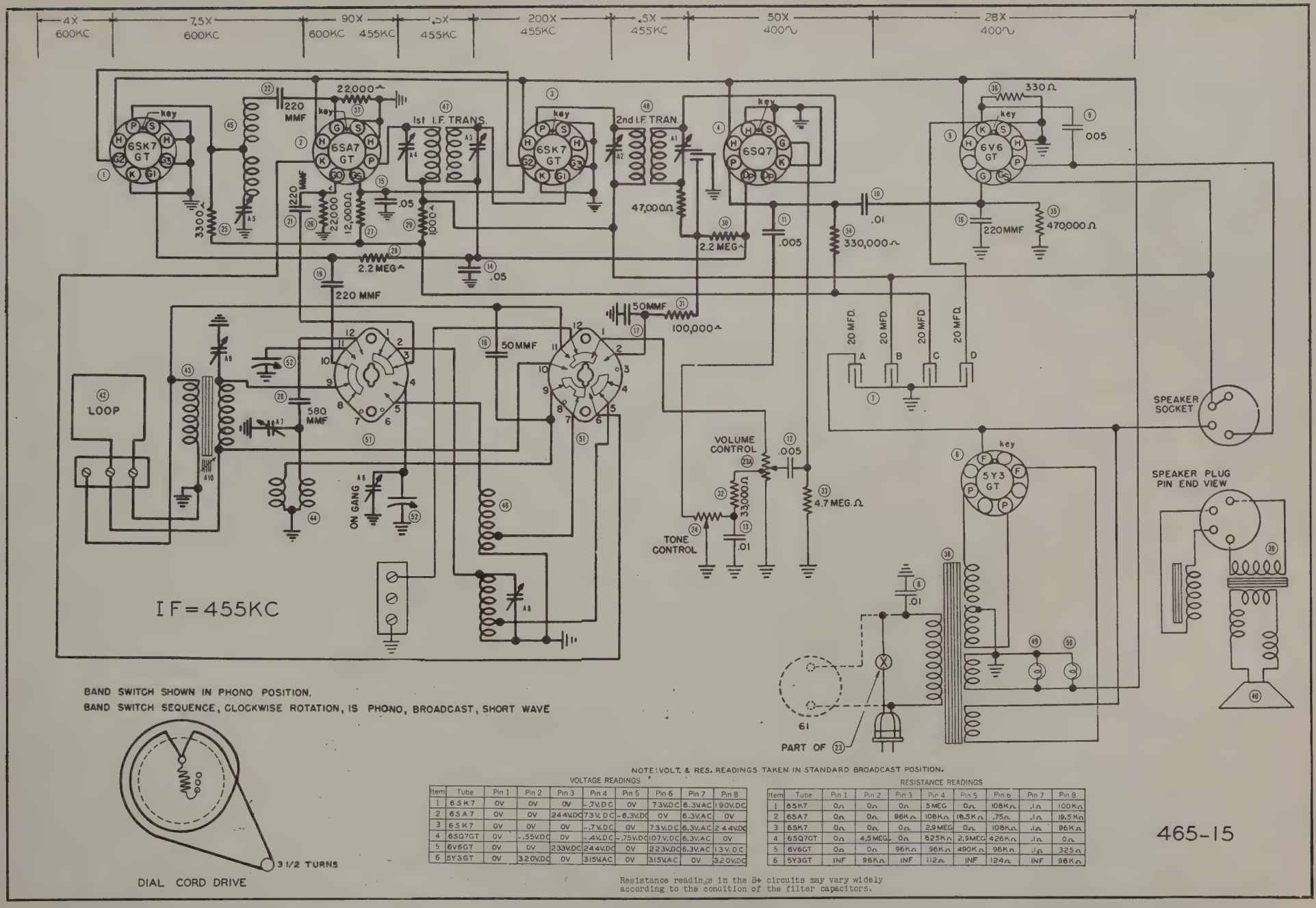
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					CROSLEY PART No.		
49	Bayonet	6-8	0.2	White	W-43567		Type 51
50	"	6-8	0.2	"	W-43567		" "

MISCELLANEOUS

ITEM No.	PART NAME	CROSLEY PART No.	NOTES
51	Band Switch	B-134639	2 Section
52	Tuning Cap.	B-134995	2 Gang Variable Cap.
A5	Trimmer		Wave Trap Adj.
A7	Trimmer	B-132386-7	SW Ant. Adj.
A8	Trimmer		BC Ant. Adj.
A9	Trimmer	W-132267-1	BC Ant. Adj.
	Dial Pointer	B-134571	
	Cabinet	R-134592	Brown Plastic (66TA)
	"	AW-134737	Ivory " (66TW)
	"	R-135025	Wood (66TC)
	Knob	W-130917	(66TA, 66TC)
	"	W-134635	(66TW)

CHASSIS—BOTTOM VIEW





BAND SWITCH SHOWN IN PHONO POSITION.

BAND SWITCH SEQUENCE, CLOCKWISE ROTATION, IS PHONO, BROADCAST, SHORT WAVE

DIAL CORD DRIVE

NOTE: VOLT. & RES. READINGS TAKEN IN STANDARD BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0V	0V	0V	-.7V.DC	0V	73V.DC	6.3V.AC	190V.DC
2	6SA7	0V	0V	244V.DC	73V. DC	-6.3V.DC	0V	6.3V.AC	0V
3	6SK7	0V	0V	0V	-.7V.DC	0V	73V.DC	6.3V.AC	244V.DC
4	6SQ7GT	0V	-.55V.DC	0V	-.4V.DC	-.75V.DC	107V.DC	6.3V.AC	0V
5	6V6GT	0V	0V	233V.DC	244V.DC	0V	223V.DC	6.3V.AC	13V.DC
6	5Y3GT	0V	320V.DC	0V	315V.AC	0V	315V.AC	0V	320V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0Ω	0Ω	0Ω	5 MEG	0Ω	108KΩ	.1Ω	100KΩ
2	6SA7	0Ω	0Ω	98KΩ	108KΩ	18.5KΩ	.75Ω	.1Ω	19.5KΩ
3	6SK7	0Ω	0Ω	0Ω	2.9MEG	0Ω	108KΩ	.1Ω	96KΩ
4	6SQ7GT	0Ω	4.5MEG.	0Ω	825KΩ	2.9MEG	426KΩ	.1Ω	0Ω
5	6V6GT	0Ω	0Ω	96KΩ	96KΩ	490KΩ	96KΩ	.1Ω	325Ω
6	5Y3GT	INF	96KΩ	INF	112Ω	INF	124Ω	INF	96KΩ

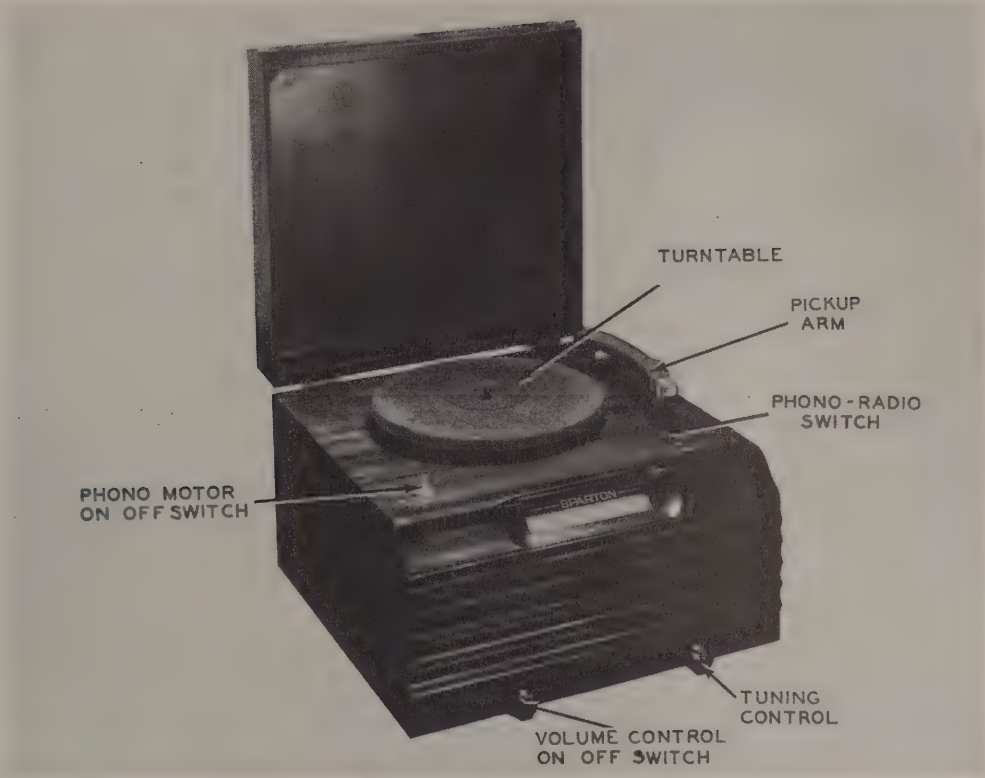
Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-15

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SPARTON
MODEL 5AM26-PS



SPARTON
MODEL 5AM26-PS

SPARTON MODEL 5AM26-PS

TRADE NAME	Sparton Model 5AM26-PS (Ch. 5-26-PS)
MANUFACTURER	Sparks-Withington Co., Jackson, Michigan
TYPE SET	AC Operated Comb. Auto. Phono.-Superheterodyne Receiver, Self Contained Loop Antenna
TUBES (FIVE)	Types, 6SA7GT Mixer, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6F6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	117 Volts AC RATING .470 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output of signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.05 MFD	High side to pin 8 (grid) 6SA7. Low side to chassis.	455KC	High freq. end of dial.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMFD	High side to ant. (blue) lead. Low side to chassis.	1600KC	1600KC	"	A5	" " " "
200 MMFD	"	1400KC	Tune in 1400 KC signal.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: SPARTON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Mixer	6SA7GT	6SA7GT	8AD	
2	IF Amp.	6SK7GT	6SK7GT	8N	
3	Det.-AVC-AF	6SQ7GT	6SQ7GT	8Q	
4	Power Output	6F6GT	6F6GT	7S	
5	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SPARTON PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	10	450		FP332	DY-2x10-450/20-25	EL-202	AF22J4A	UP6CJ12	■ Filter
B	10	450							▲ "
C	20	25							Cath. Bypass
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Bypass
8	.002	400		TP405	S-6-002	TC-22	464-002	DT6D2	Phono Coupling
9	.01	600		TP410	S-6-01	TC-11	684-01	DT4S1	6F6 Plate Bypass
10	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	RF Bypass Pwr. Supp.
11	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Audio Coupling
12	.02	200		TP423	S-4-02	TC-12	484-02	DT4S2	" "
13	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
14	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Conv. Screen Bypass
15	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Audio Plate Bypass
16	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
17	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	" " "
18	15	500		MC215	M0.5-41	1FM-41	1468-00001	5W5Q1	Fixed Trimmer

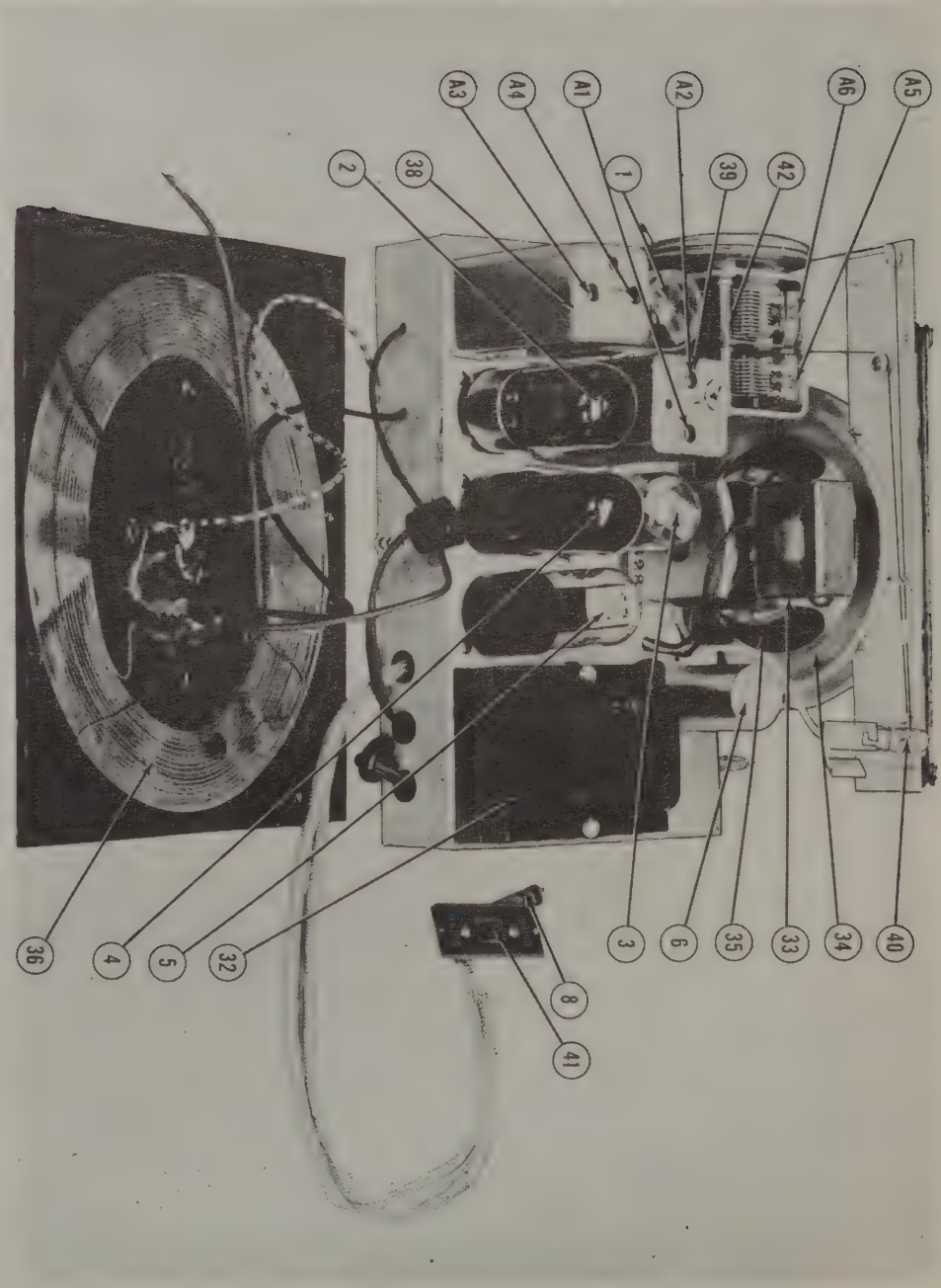
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
19A	500KΩ	1	PA4400-3	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 19A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SPARTON PART No.	IRC PART No.	IDENTIFICATION CODES
20	20KΩ	½		BTS-22K	Red-Blk.-Or. Osc. Grid
21	10KΩ	2		BT-2-10K	Br.-Blk.-Or. Mixer Screen Dropping
22	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
23	56KΩ	½		BTS-56K	Grn.-Blue-Or. IF Filter
24	27KΩ	1		BTA-27K	Red-Vi.-Or. Voltage Divider
25	270Ω	½		BW-½-270	Red-Vi.-Br. Voltage Divider
26	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. 1st AF Grid
27	270KΩ	½		BTS-270K	Red-Vi.-Yl. 1st AF Plate Load
28	680KΩ	½		BTS-680K	Blue-Gray-Yl. Output Grid
29	680Ω	½		BTS-680	Blue-Gray-Br. Output Cathode
30	680Ω	2		BT-2-680	Blue-Gray-Br. Filter
31	100Ω	½		BW-½-100	Br.-Blk.-Br. Bias

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			INSTALLATION NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	SPARTON PART No.	STANCOR PART No.	THORDARSON PART No.	
32	117VAC @.470A.	560VCT @ .051A	5.1VAC @ 1.8A.	6.4VAC @1.8A.		P-6119†	T13R11	†Drill four new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SPARTON PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
33	8000Ω	3.4Ω	500Ω	.85Ω	Part of 63000-4	A-3878‡	T-14S81‡		‡Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SPARTON PART No.	JENSEN PART No.		
	FIELD RES.	VC IMP.		ST-449*		*Shunt replacement speaker field with 3000Ω 20 watt resistor.
34	750Ω	3.4Ω	63000-4	Mod. H5-S		
	CONE DIA.	VC DIA.				
35	4-13/16"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	SPARTON PART No.	MEISSNER PART No.	
36	Loop Ant.	0Ω	.7Ω			
37	Osc. Coil		6.5Ω		14-1040	Add 50 MMFD cap. from grid to high side tuning cap.
38	Input IF	11.5Ω	11.5Ω		16-6658	
39	Output IF	6Ω	6Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					SPARTON PART No.		
40	Bayonet	6-8	0.25	Blue			Type 44

DISASSEMBLY INSTRUCTIONS

1 - Remove the volume and tuning control push-on type knobs.

2 - Remove the two felt washers.

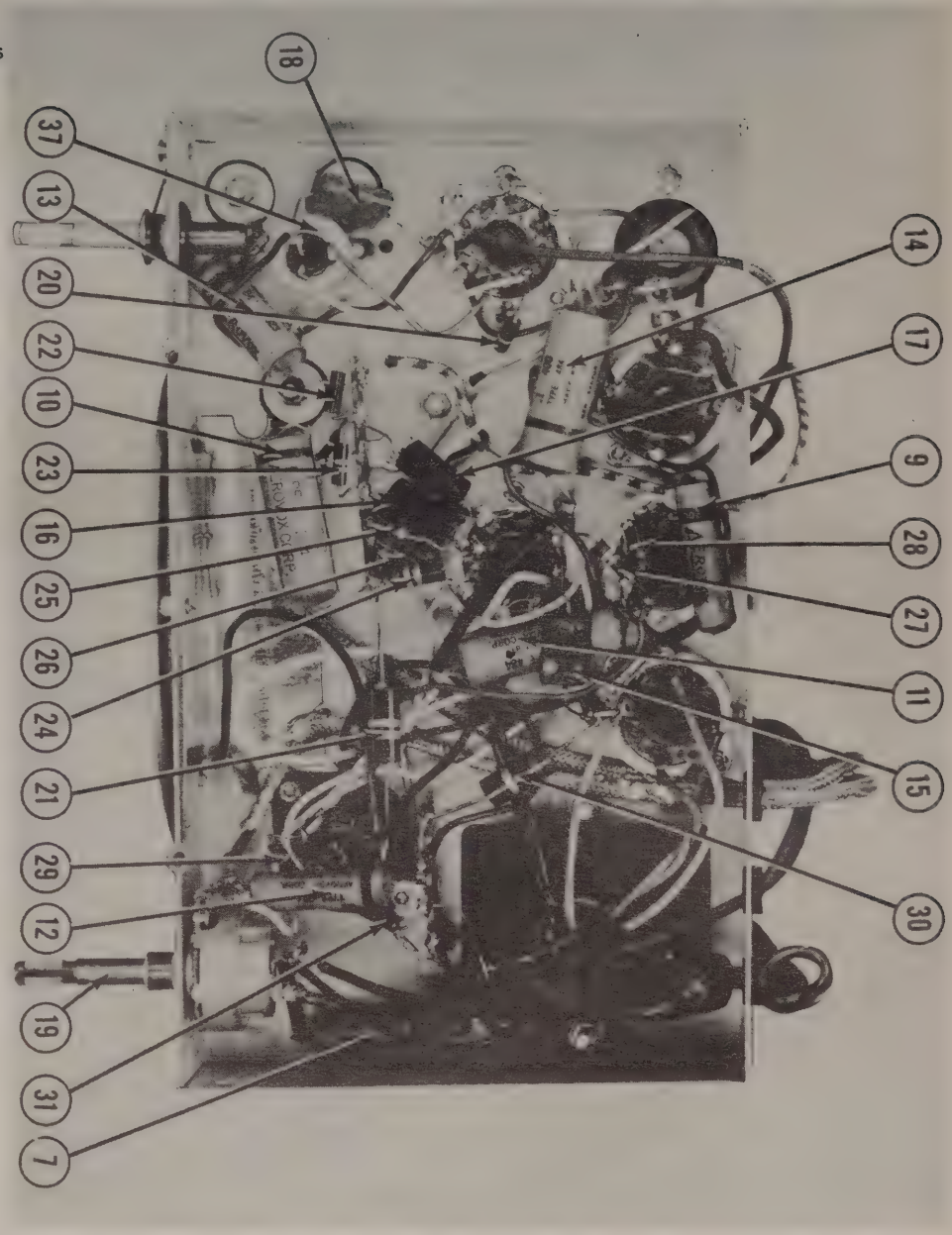
3 - Disconnect phono-motor plug.

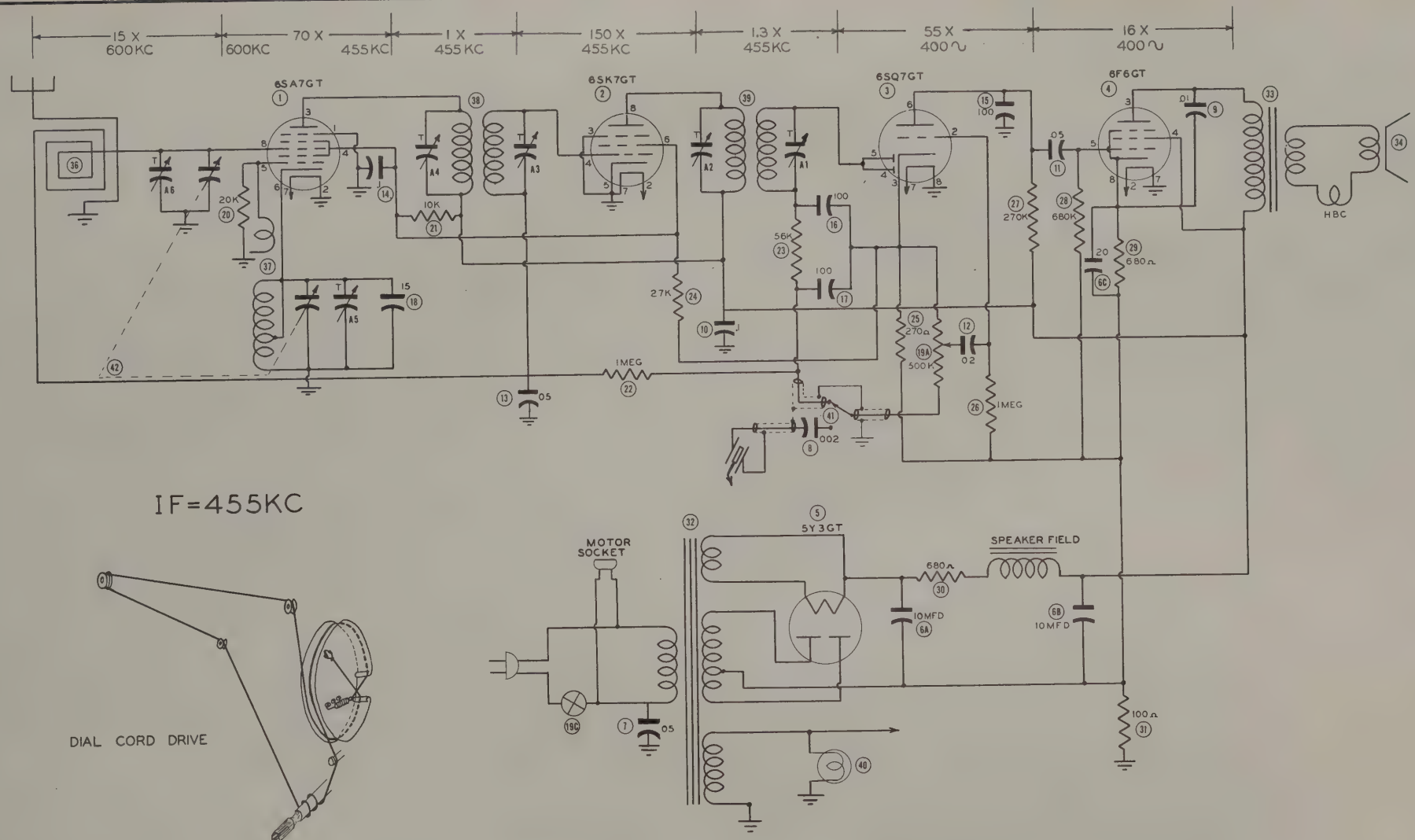
4 - Remove antenna loop from cabinet by removing two nails.

5 - Unsolder two phono-pickup leads from phono-radio-switch.

6 - Remove the three screws holding chassis to cabinet. Remove chassis.

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7GT	0V	0V	235V.DC	92V. DC	-.5V. DC	0V	6.6V. AC	-.65V. DC
2	6SK7GT	0V	6.6V. AC	0V	-.75V. DC	0V	72V. DC	0V	235V.DC
3	6SQ7GT	0V	-1.35V. DC	-1.2V. DC	-1.6V. DC	-1.6V. DC	97V. DC	6.6V. AC	0V
4	6F6GT	0V	6.6V. AC	222VDC	232V.DC	-.5V. DC	-2.2V.	0V	15.5V.DC
5	5Y3GT	0V	300V.DC	0V	295V. AC	0V	295VAC	0V	300V. DC

RESISTANCE READINGS

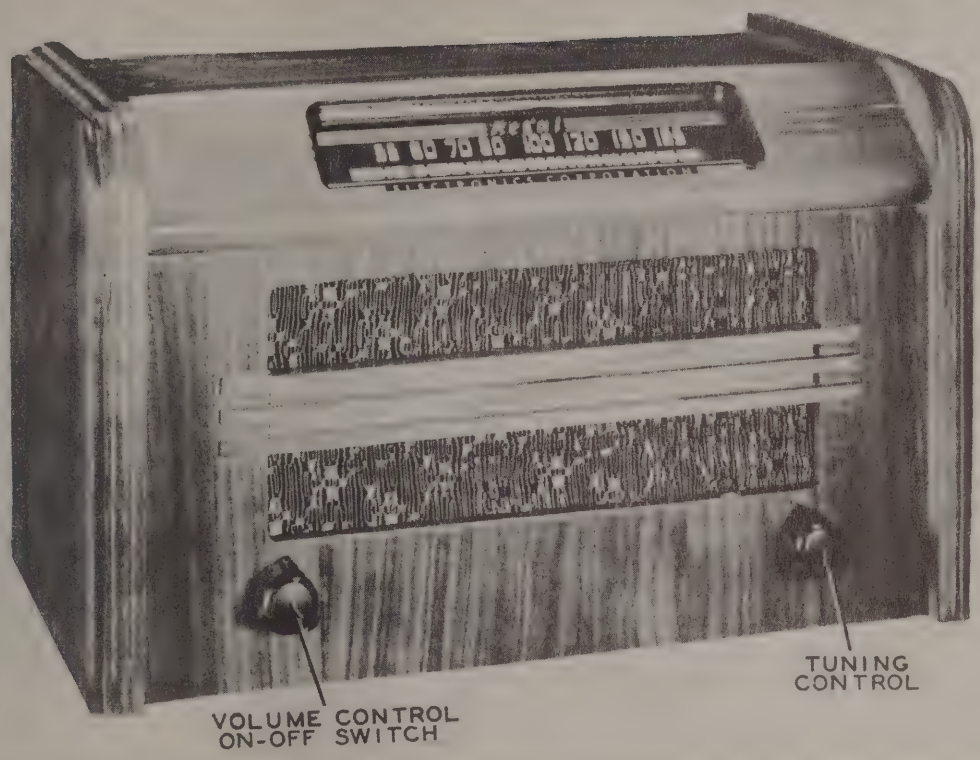
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SA7GT	0Ω	0Ω	34KΩ	27KΩ	19KΩ	.5Ω	0Ω	1.4 MEG
2	6SK7GT	0Ω	0Ω	0Ω	1.4MEG	0Ω	28KΩ	0Ω	34KΩ
3	6SQ7GT	0Ω	1.2 MEG	365Ω	625KΩ	625KΩ	304KΩ	0Ω	0Ω
4	6F6GT	0Ω	0Ω	34KΩ	34KΩ	600KΩ	100Ω	0Ω	675Ω
5	5Y3GT	INF	36KΩ	INF	310Ω	INF	325Ω	INF	36KΩ

465-17

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



REGAL
MODEL L76

REGAL
MODEL L76

REGAL MODEL L-76

TRADE NAME	Regal Model L-76
MANUFACTURER	Regal Electronics Corp., 20 West 20th St., New York, N.Y.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 12SK7GT RF Amp., 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volt AC-DC RATING .245 Amps. @ 117V AC
TUNING RANGE--BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS

Use isolating transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1	High side to pin #8 of 12SA7. Low side to chassis.	455KC	High freq.end of dial.(Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ant. lead. Low side to chassis.	455KC	Low freq. end of dial.(Variable fully closed)	"	A5	Adjust for minimum output.
"	"	1650KC	High freq.end of dial.(Variable fully open)	"	A6	Adjust for maximum output.
"	"	1400KC	Tune for maximum output.	"	A7	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: REGAL PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SK7GT	12SK7GT	8N	May be 12SJ7GT in some models
2	Converter	12SA7GT	12SA7GT	8AD	
3	IF Amp.	12SK7GT	12SK7GT	8N	
4	Det.-AVC-AF	12SQ7GT	12SQ7GT	7Q	
5	Power Output	35L6GT	35L6GT	7AC	May be 50L6GT in some models
6	Rectifier	35Z5GT	35Z5GT	6AD	
	OR LOCK-IN EQUIVALENTS				

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: REGAL PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	50	150	60-101	2N521	DHN-2x50-150	UT-501		EZ5515	Filter - Red
B	50	150				UT-501			" "
8	.05	600		TP415	S-6-05	TC-15	684-05	DT6S5	Line Filter
9	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	35L6 Plate Bypass
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	" "
12	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
13	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	RF Bypass Pwr. Supp.
14	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	Ant. Coupling *
15	250	500		MC240	M0.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
16	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
17	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
18	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
19	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	RF Coupling

*May be .01 MFD in some models

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGAL PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
20A	1 Meg.	1	7241928	MR53	D13-137	M-63-Z	Volume Control-See Note 1
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 20A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
20A	500KΩ	1	20-101	MR48	D13-133	M-60-Z	Volume Control-See Note 1
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 20A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

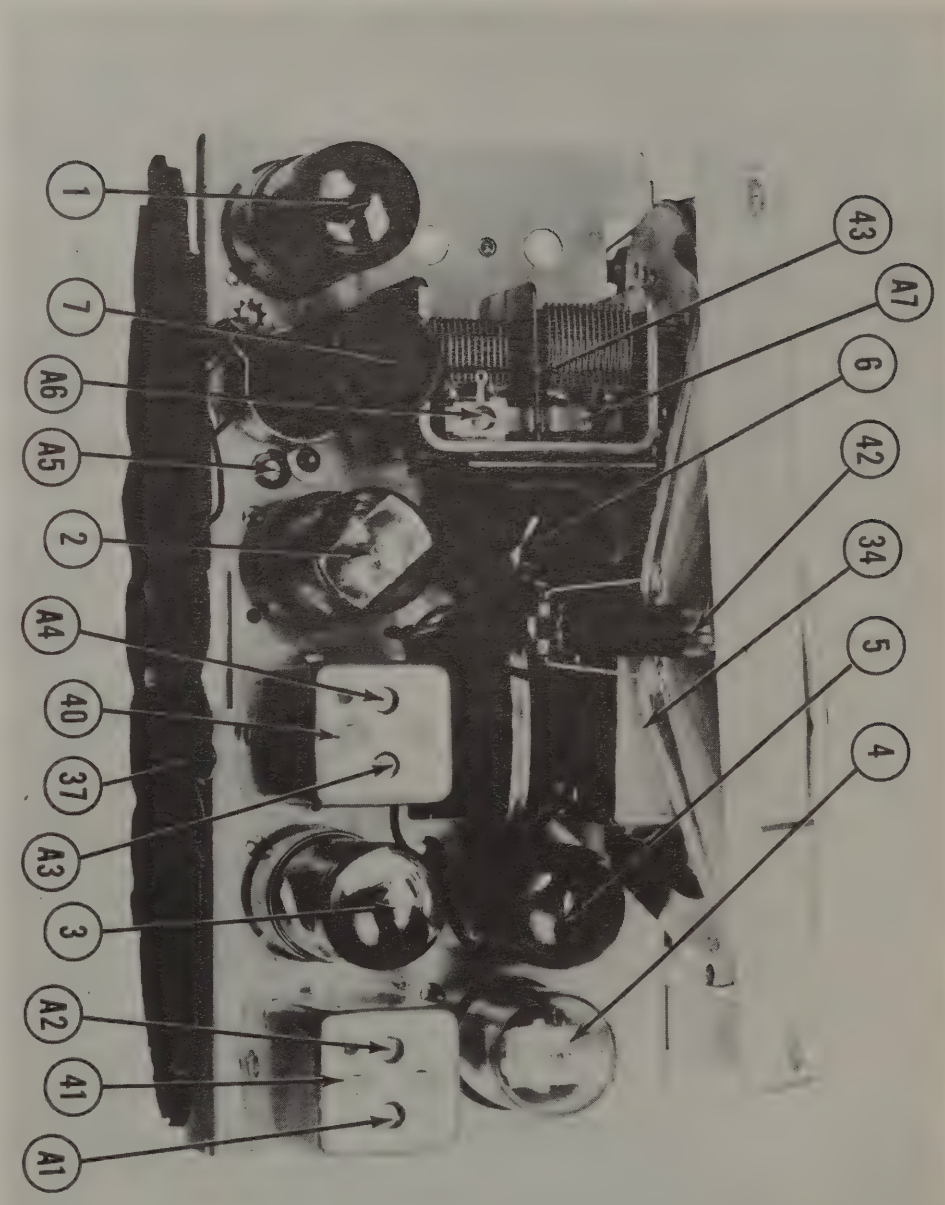
Note 1 - Used in later production
Note 2 - Used in early production

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: REGAL PART No.	IRC PART No.	IDENTIFICATION CODES
21	50Ω	½		BW-½-47	Grn.-Blk.-Blk. RF Cathode
22	5000Ω	½		BTS-4700	Grn.-Blk.-Red RF Plate Load
23	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Converter Grid
24	25KΩ	½		BTS-22K	Red-Grn.-Or. Osc. Grid
25	300Ω	½		BW-½-270	Or.-Blk.-Br. IF Cathode-See Note 3
26	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
27	250KΩ	½		BTS-220K	Red-Grn.-Yl. 1st AF Plate Load
28	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. AVC Network
29	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
30	500KΩ	½		BTS-470K	Grn.-Blk.-Yl. Output Grid
31	120Ω	½		BW-½-120	Br.-Red-Br. Output Cathode
32	1000Ω	2		BTA-1000	Br.-Blk.-Red Filter
33	15Ω	1		BW-1-15	Br.-Grn.-Blk. Rectifier Ballast

Note 3 - Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		REGAL PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
34	15502	3.452	1902	.92		A-3876†	T-22S45		†Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			REGAL PART No.	JENSEN PART No.		
	FIELD	VC IMP.				
35	PM	3.45Ω	110-101	ST-107		
	CONE DIA.	VC DIA.				
36	4-3/4"	1/2"	CONE HAS SPECIAL ADJUSTMENT FEATURE-ORDER FROM MANUFACTURER.			

R F COILS

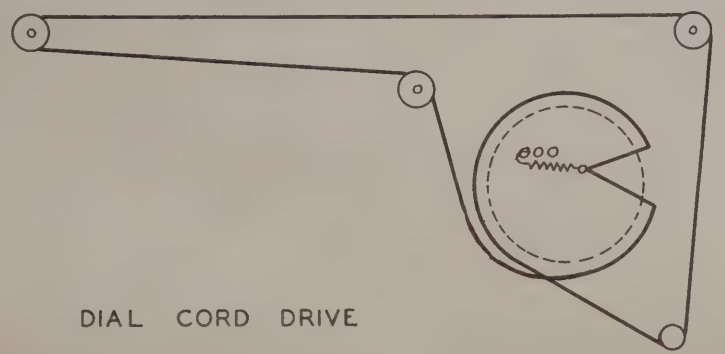
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	REGAL PART No.	MEISSNER PART No.	
37	Loop Ant.	1Ω	1Ω	30-103		
38	Wave Trap	44Ω		30-106		
39	Osc. Coil		3.5Ω	30-101	14-1040	
40	Input IF	16Ω	15Ω	30-104	16-5740	
41	Output IF	15Ω	16.5Ω	30-105	16-5742	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					REGAL PART No.		
42	Bayonet	6-8	0.15	Brown			Type 47

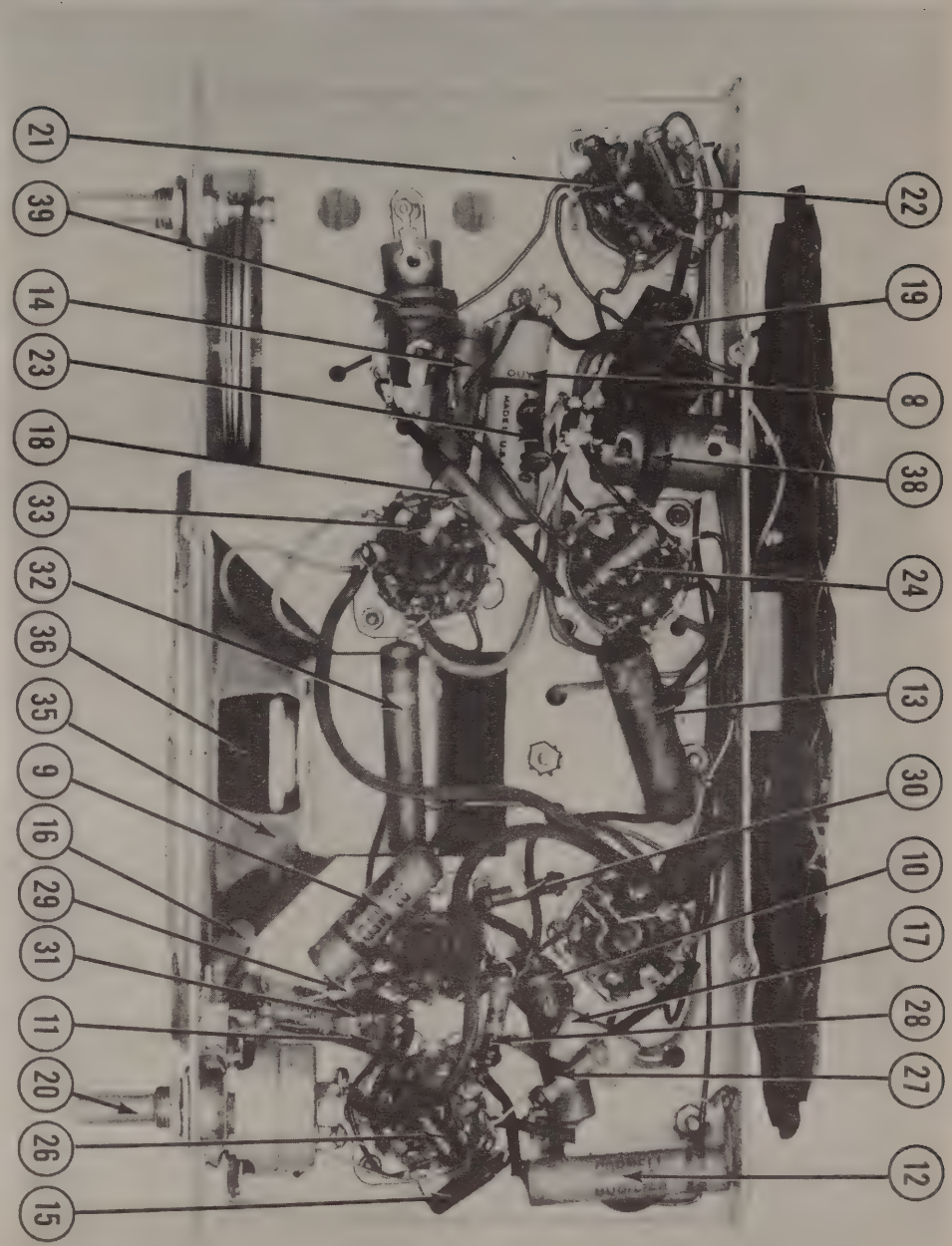
MISCELLANEOUS

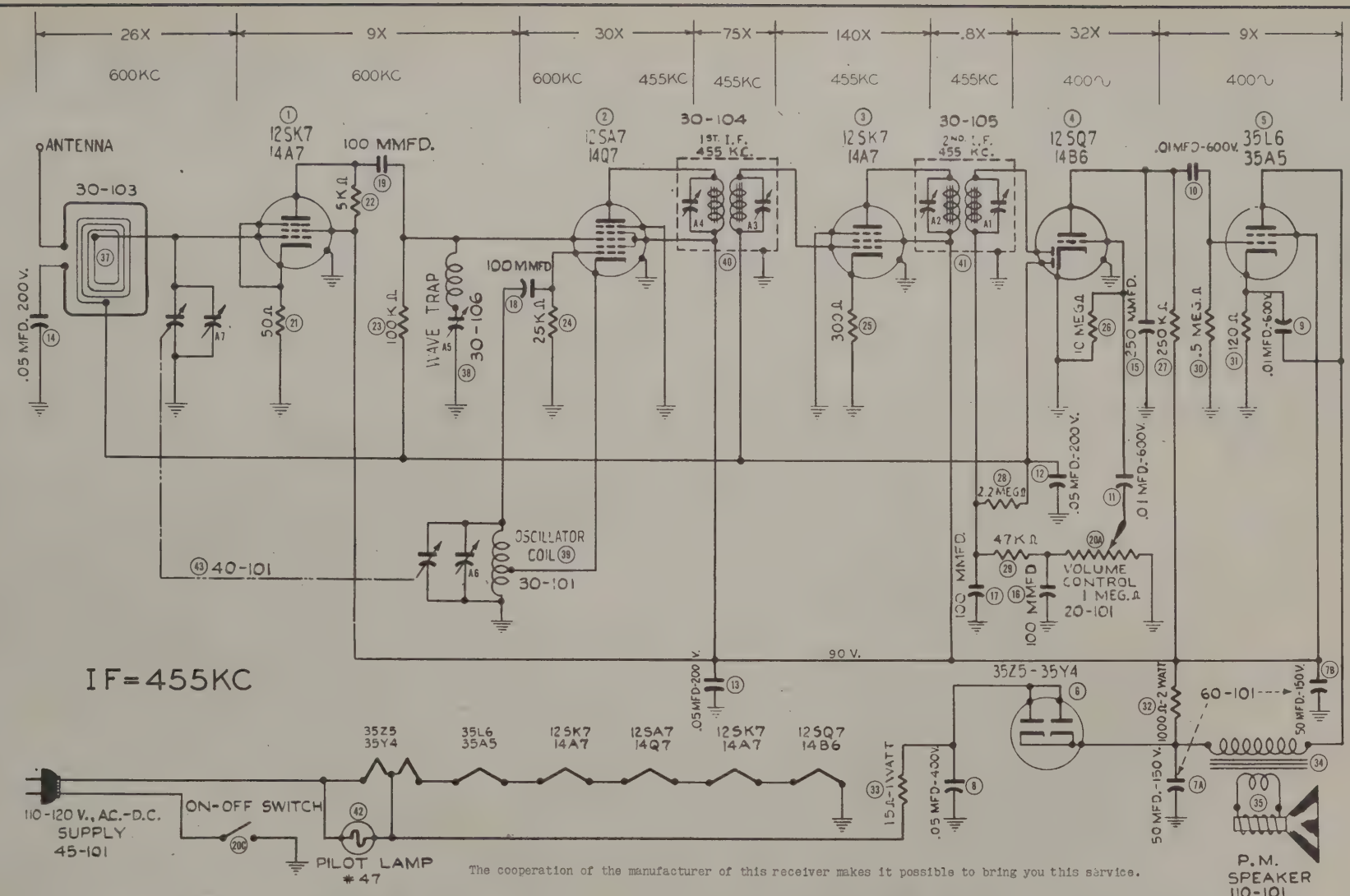
ITEM No.	PART NAME	REGAL PART No.	NOTES
43	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7GT	0V.	21V.AC	.27V.DC	-.45V.DC	.27V.DC	81V. DC	10.5V.AC	58V DC
2	12SA7GT	0V.	32.5V.AC	81V.DC	81V.DC	- 4.9VDC	0V.	21V.A C	-.2V.DC
3	12SK7GT	0V.	43V.AC	0V.	-.45V.DC	0V.	81V. DC	32.6V.DC	81V.DC
4	12SQ7GT	0V.	-.25V.DC	0V.	-.2V. D C	-.45V DC	52V. DC	10.5V.AC	0V.
5	50L6GT	0V.	90V.AC	107V.DC	81V.DC	0V.	-.2V. DC	43V.AC	4.8V.DC
6	35Z5GT	0V.	117V.AC	113V.AC	0V.	112V.AC	0V.	90VAC	113V.DC

RESISTANCE READINGS

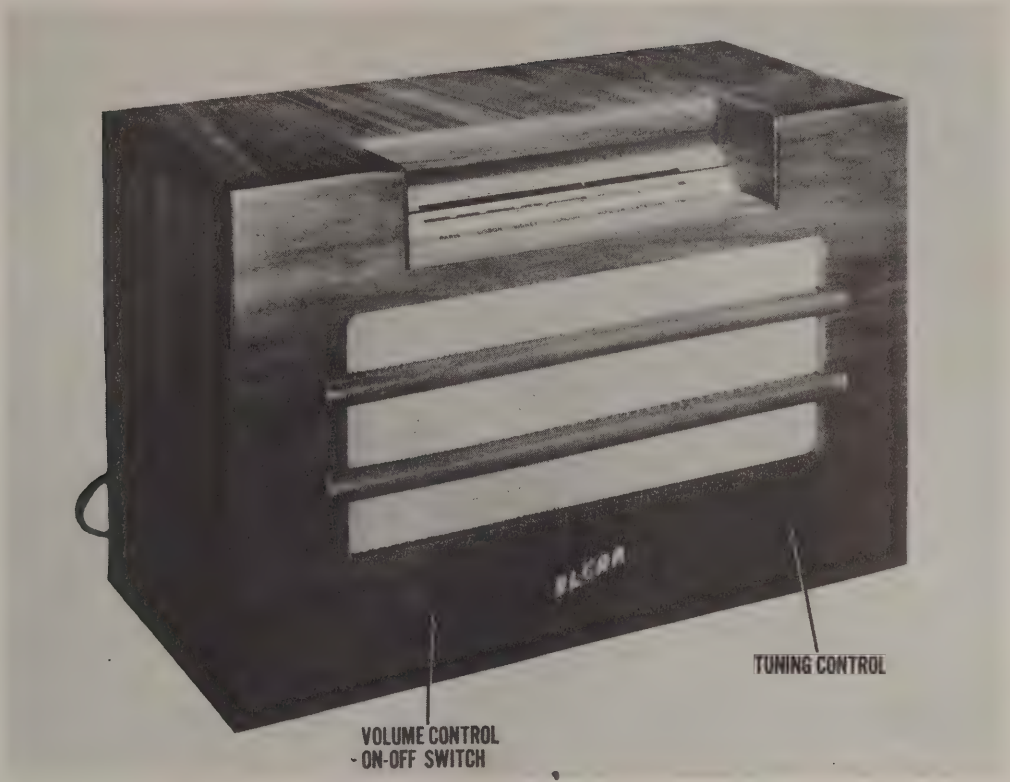
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SJ7GT	0 Ω	23 Ω	42 Ω	3.1MEG	42 Ω	61 K Ω	12 Ω	66K Ω
2	12SA7GT	0 Ω	35 Ω	61K Ω	61 K Ω	25K Ω	.25 Ω	23 Ω	3.2MEG
3	12SK7GT	0 Ω	47 Ω	0 Ω	3.1MEG	0 Ω	61 K Ω	35 Ω	61 K Ω
4	12SQ7GT	0 Ω	1.0MEG	0 Ω	1.15MEG	3.1MEG	310 K Ω	12 Ω	0 Ω
5	50L6GT	INF	92 Ω	61 K Ω	61 K Ω	510 K Ω	1.15MEG	47 Ω	120 Ω
6	35Z5GT	INF	118 Ω	115 Ω	INF	132 Ω	INF	92 Ω	61 K Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-18

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



ELCAR
MODEL 602

ELCAR
MODEL 602

ELCAR MODEL 602

TRADE NAME	Elcar Model 602
MANUFACTURER	Union Electronics Corp., 38-01 Queens Blvd., Long Island City, N.Y.
TYPE SET TUBES (SIX)	AC-DC 2 Band Superheterodyne - Self Contained Loop Antenna Types, 12SK7GT RF Amp., 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 35A5 Power Output, 35Y4 Rectifier.
POWER SUPPLY	117 Volts AC-DC RATING - .270 Amps. @ 117V AC
TUNING RANGE—BROADCAST	530-1680KC SHORT WAVE 5.5 - 18.3MC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting. DO NOT ATTEMPT ALIGNMENT ON A METAL BENCH.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin 8 of 12SA7. Low side to chassis.	455KC	BC	High freq. end of dial. (Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
200 MMF	High side to ant. lead. Low side to chassis.	1680KC	"	"	"	A5	" " " "
"	"	1400KC	"	Tune for maximum output.	"	A6	" " " "
"	"	600KC	"	"	"	A7	Rock dial and adjust for maximum output. Recheck A5 at 1680 KC and A6 at 1400KC.
400 ohms	"	18.3MC	SW	High freq. end of dial. (Variable fully open)	"	A8	Adjust for maximum output
400 ohms	"	15MC	"	Tune for maximum output.	"	A9	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		ELCAR PART No.	STANDARD REPLACEMENT		
1	RF Amp.		12SK7GT	8N	
2	Converter		12SA7GT	8AD	
3	IF Amp.		12SK7GT	8N	
4	Det.-AVC-AF		12SQ7GT	8Q	
5	Power Output		35A5	6AA	
6	Rectifier		35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	ELCAR PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
7A	40	150		2N511	M-2x40-150	TA-440	PRSA150-40-40	BRD4415	Filter - Red
B	40	150							" - "
8	50	50		TC39	M-50-50	TA-550	PRS50-50	BR505	Cath. Bypass
9	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
10	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	35A5 Plate Bypass
11	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	Audio Coupling
12	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	Audio Coupling
13	.007	800		TP445					Fixed Padder
14	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	Screen Bypass
15	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
16	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	Ant. Coupling
17	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Audio Plate Bypass
18	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
19	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
20	50	500		MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor
21	300	500		MC241	M0.5-33	1FM-33	1468-0003	5W5T3	RF Coupling

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	ELCAR PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
22A	500KΩ	1	500M-6	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 22A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

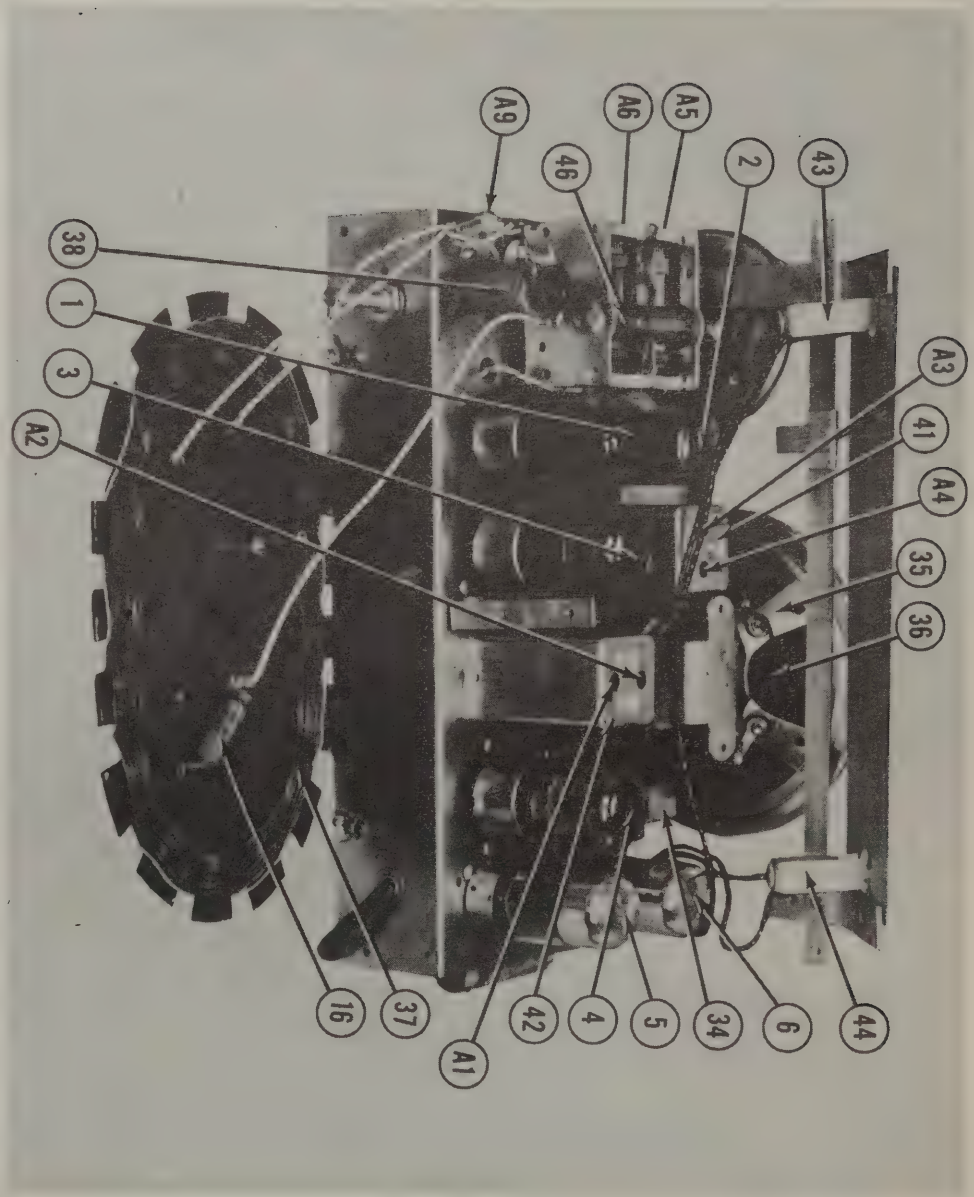
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ELCAR PART No.	IRC PART No.	
23	3300Ω	½		BTS-3300	Or.-Or.-Red RF Plate Load
24	100KΩ	1		BTA-100K	Br.-Blk.-Yl. Converter Grid
25	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
26	1 Meg.	1		BTA-1 Meg.	Br.-Blk.-Grn. AVC Network
27	100KΩ	1		BTA-100K	Br.-Blk.-Yl. IF Filter
28	330KΩ	1		BTA-330K	Or.-Or.-Yl. 1st AF Plate Load
29	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. 1st AF Grid
30	500KΩ	½		BTS-500K	Grn.-Blk.-Yl. Output Grid
31	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
32	50Ω	1		BW-1-47	Grn.-Blk.-Blk. Pilot Light Shunt

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA			INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000)	ELCAR PART NO.	STANCOR PART NO.	THORDARSON PART NO.	
33	70MA	100Ω	2 Henries			T57C51*	*Drill one new mounting hole

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ELCAR PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
34	1950Ω	2.3Ω	182Ω	.66Ω		A-3876	T-22545		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ELCAR PART No.	JENSEN PART No.		INSTALLATION NOTES
35	FIELD PM	VC IMP. 2.3Ω		ST-107 Mod. P5-V		
36	CONE DIA. 4-3/4"	VC DIA. 9/16"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

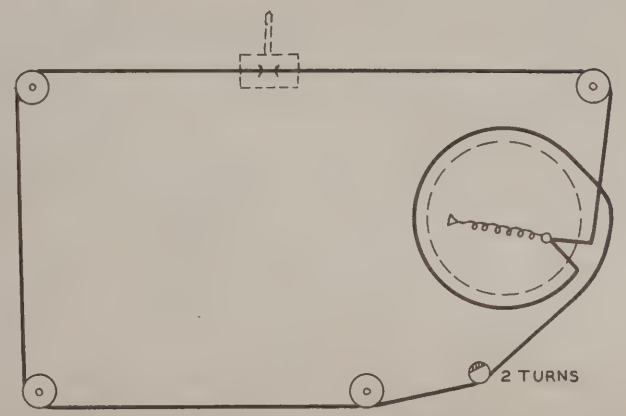
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ELCAR PART No.	MEISSNER PART No.	INSTALLATION NOTES
37	Loop Ant.	0Ω	1.3Ω			
38	SW Ant.Coil	.1Ω	0Ω		14-1044	
39	BC Osc. "		5.3Ω		14-1040	
40	SW Osc. "		.3Ω		14-1046	
41	Input IF	16Ω	16Ω		16-6656	
42	Output IF	14Ω	14Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ELCAR PART No.		INSTALLATION NOTES
43	Bayonet	6-8	0.15	Brown			Type 47
44	"	6-8	0.15	"			" "

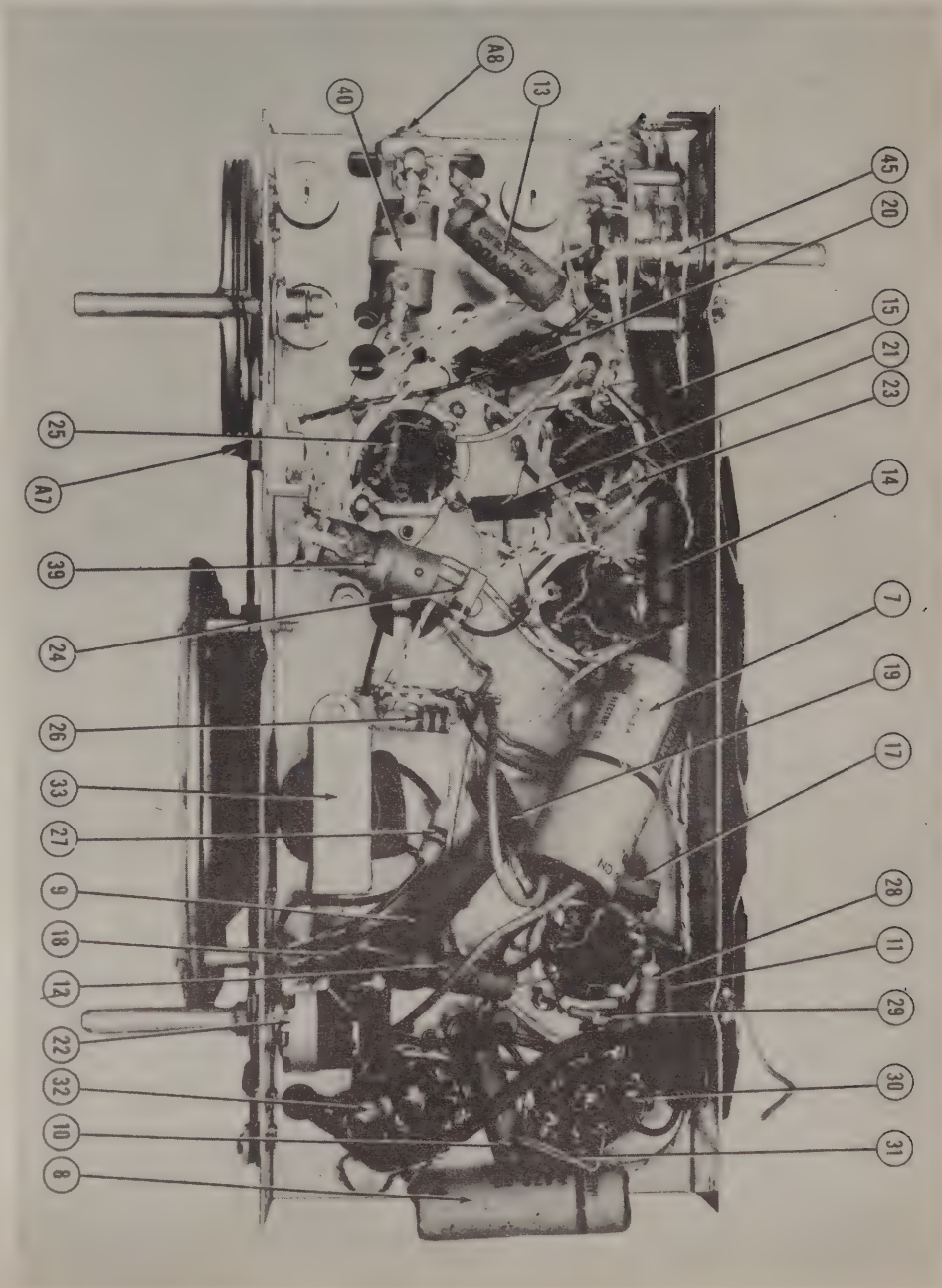
MISCELLANEOUS

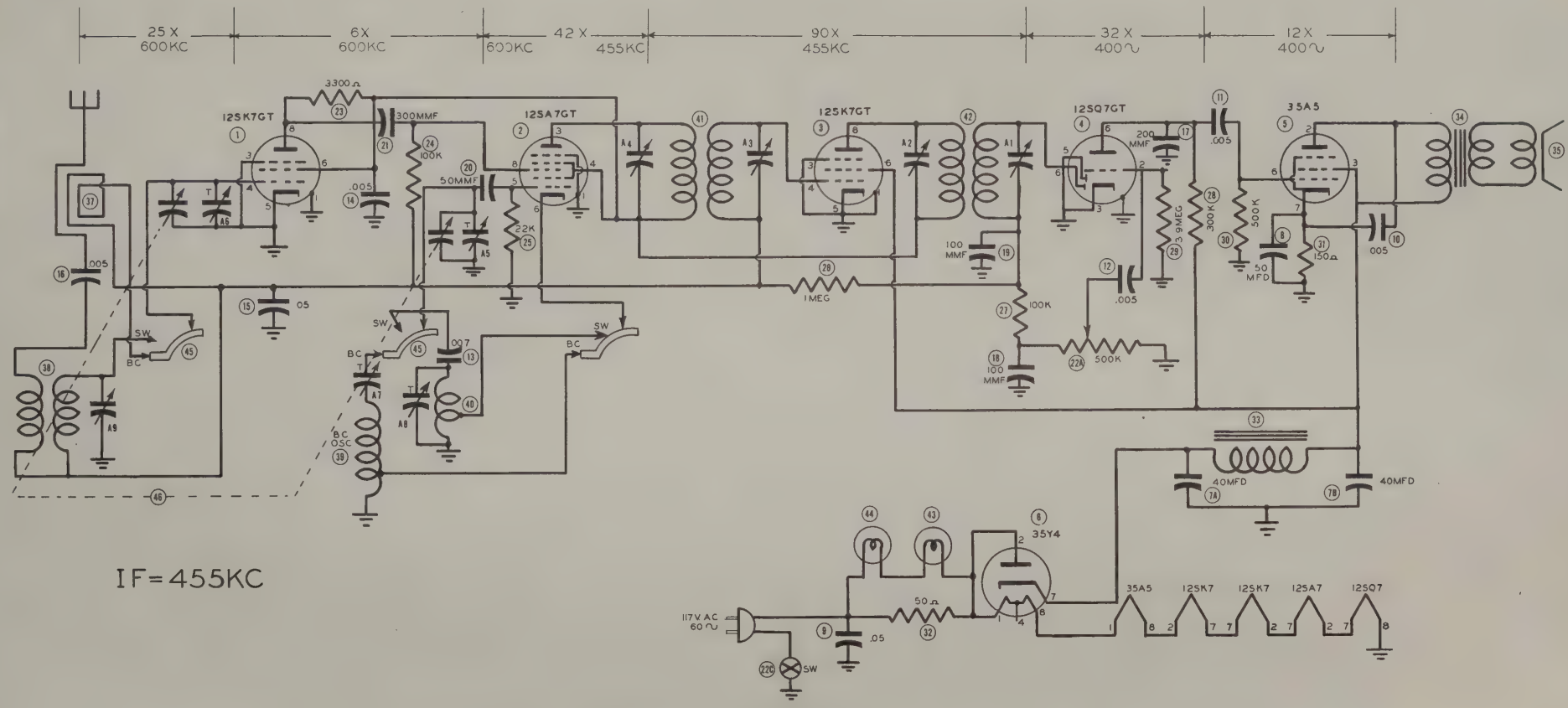
ITEM No.	PART NAME	ELCAR PART No.	NOTES
45	Switch		Band (2 position)
46	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





NOTE: VOLTAGE AND RESISTANCE READINGS TAKEN IN STANDARD BROADCAST POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	0V	22.6VAC	0V	-.5V. DC	0V	98V. DC	34.5VAC	66 V.DC
2	12SA7GT	0V	10.6V. AC	98V. DC	98V. DC	-.5V. DC	0V	22.6VAC	-4V. DC
3	12SK7GT	0V	45.8VAC	0V	-.5V. DC	0V	98V. DC	34.5VAC	98V. DC
4	12SQ7GT	0V	-55V. DC	0V	-3V. DC	0V	69V. DC	10.6V. AC	0V
5	35A5	78V. AC	93V. DC	98V. DC	0V	0V	0V	5.7V. DC	45.8V.AC
6	35Y4	112V. AC	112V. AC	114V.AC	105V.AC	0V	117V. AC	107V. DC	78V. AC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	0Ω	23Ω	0Ω	1.8 MEG	0Ω	115KΩ	35Ω	118KΩ
2	12SA7GT	0Ω	11Ω	115KΩ	115KΩ	25KΩ	.4Ω	23Ω	1.9 MEG
3	12SK7GT	0Ω	47Ω	0Ω	1.8MEG	0Ω	115KΩ	35Ω	115KΩ
4	12SQ7GT	0Ω	3.2 MEG	0Ω	610KΩ	0Ω	450KΩ	11Ω	0Ω
5	35A5	80Ω	115KΩ	115KΩ	INF	INF	450KΩ	150Ω	47Ω
6	35Y4	110Ω	110Ω	115Ω	104Ω	INF	118Ω	115KΩ	80Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-19

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

AUTOMATIC
MODEL C60

AUTOMATIC
MODEL C60

AUTOMATIC MODEL C60

TRADE NAME	Automatic Model C60
MANUFACTURER	Automatic Radio Mfg. Co., Inc., 122 Brookline Ave., Boston, Mass.
TYPE SET	Three Power Portable AC-DC Battery Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output, 0Y4 Rectifier.
POWER SUPPLY	110 Volts AC-DC or 6 Volt "A" battery (Eveready type No. 747 or equivalent); 45 Volt "B" Battery (Eveready type No. 482 or equivalent)
TUNING RANGE—BROADCAST	550-1600KC

ALIGNMENT INSTRUCTIONS

If set is aligned on AC operation use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of rear section of variable. Low side to chassis.	455KC	High freq. end of dial. (Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	Connect output of signal generator to two turns of wire and radiate signal into loop.	1600KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	1R5	1R5	7AV	
2	IF Amp.	1T4	1T4	6AR	
3	Det.-AVC-AF	1S5	1S5	6AU	
4	Power Output	3Q4	3Q4	7BA	
5	Rectifier	0Y4	0Y4	4R	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: AUTOMATIC PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150		FP304		EL-230	AF66D	UP4CJ59	■ Filter
B	25	150					PRS25-100		▲ "
C	200	10				UHC212	PRS25-100		Filament Filter
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.002	600		TP405	S-6-002	TC-22	684-002	DT6D2	3Q4 Plate Bypass
9	.002	600		TP405	S-6-002	TC-22	684-002	DT6D2	Audio Coupling
10	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	Audio Plate Decoup.
11	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	Audio Screen Bypass
12	.002	600		TP405	S-6-002	TC-22	684-002	DT6D2	Audio Coupling
13	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	Screen Bypass
14	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	AVC Filter
15	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	Filament Bypass
16	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	AVC Filter
17	500	500		MC245	MO.5-35	1FM-35	1468-0005	5W5T5	Hash Filter
18	200	500		MC237	MO.5-32	1FM-32	1468-0002	5W5T2	Starter Anode Coup.
19	200	500		MC237	MO.5-32	1FM-32	1468-0002	5W5T2	Audio Plate Bypass
20	200	500		MC237	MO.5-32	1FM-32	1468-0002	5W5T2	IF Bypass Vol. Cont.
21	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
22	12								Fixed Trimmer*

*Not used in all models.

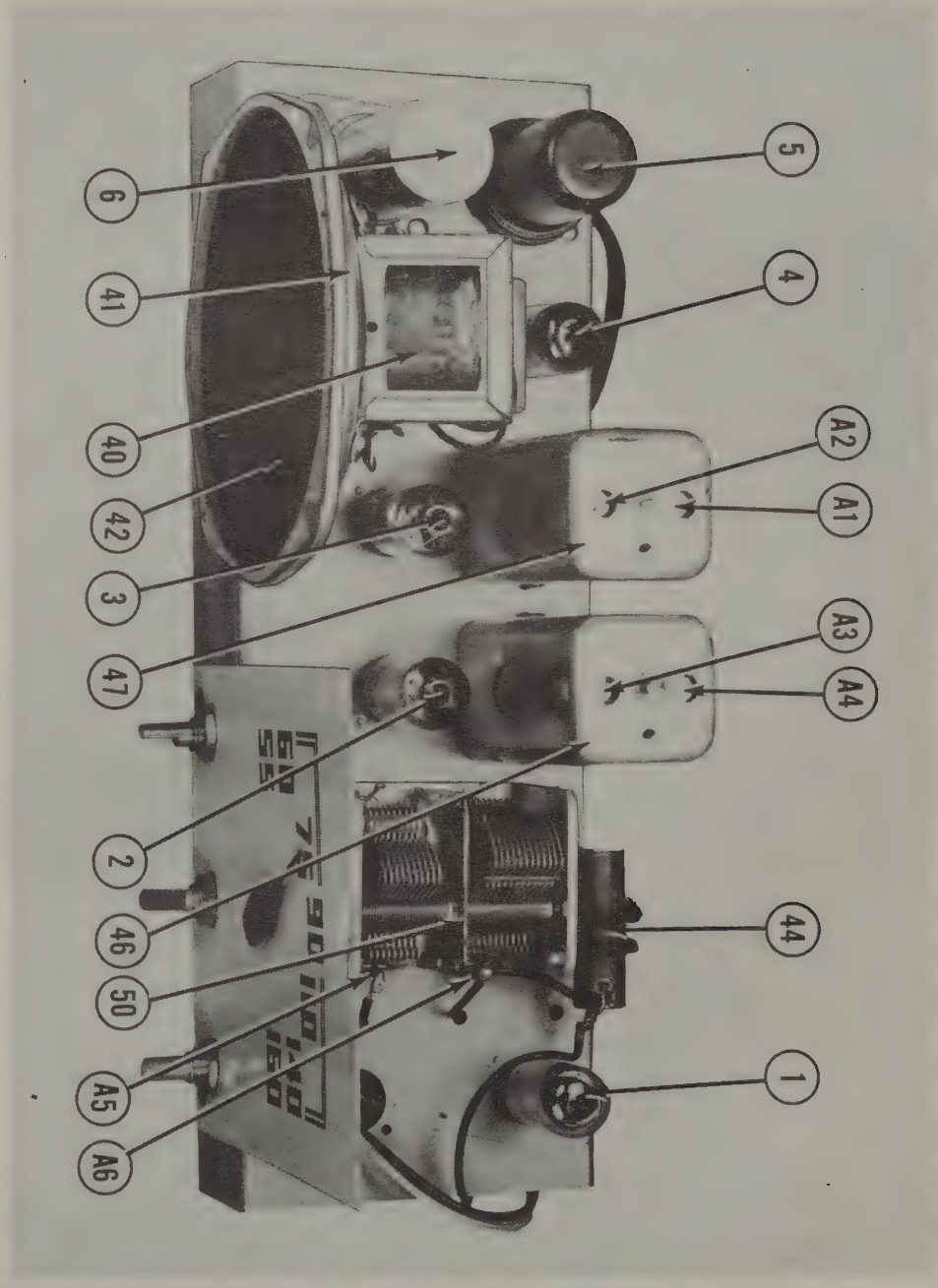
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
23A	750K	1	RV44B	MR51	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 23A per instruction
C	Switch		" "	M27	42	SW-A2	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: AUTOMATIC PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
24	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AVC Network
25	200KΩ	½		BTS-220K	Red-Blk.-Yl. Osc. Grid
26	20KΩ	½		BTS-22K	Red-Blk.-Or. Screen Dropping
27	3 Meg.	½		BTS-3.3 Meg.	Or.-Blk.-Grn. AVC Network
28	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue Bias
29	2000Ω	½		BTS-2200	Red-Blk.-Red Filament String
30	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue 1st AF Grid
31	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Screen Dropping
32	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. 1st AF Plate Load
33	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. 1st AF Plate Filter
34	620Ω	½		BW-½-680	Blue-Red-Br. Filament String
35	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. Output Grid
36	1100Ω	1		BTA-1000	Br.-Br.-Red Filter
37	1900Ω	5	CM1088	AB-2000	Filter
38	100Ω	2		BW-2-100	Br.-Blk.-Br. Rectifier Ballast
39	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue Rectifier Starter Anode Coupling

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		AUTOMATIC PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
40	12600Ω	3.5Ω	840Ω	.6Ω		A-3496	T-22548		

SPEAKER

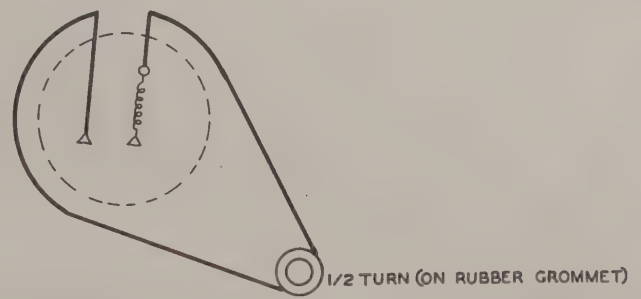
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
	FIELD	VC IMP.	AUTOMATIC PART No.	JENSEN PART No.		
41	PM	3.5Ω		ST-107 Mod. P5-V		
	CONE DIA.	VC DIA.				
42	4-1/2"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	AUTOMATIC PART No.	MEISSNER PART No.	
43	Loop Ant.		2Ω			Built in cabinet
44	Loading Coil		1Ω			
45	Osc. "	.5Ω	5Ω		14-1040	
46	Input IF	27Ω	26Ω		16-6658	
47	Output IF	23Ω	28Ω		16-6660	
48	RF Choke	11Ω				

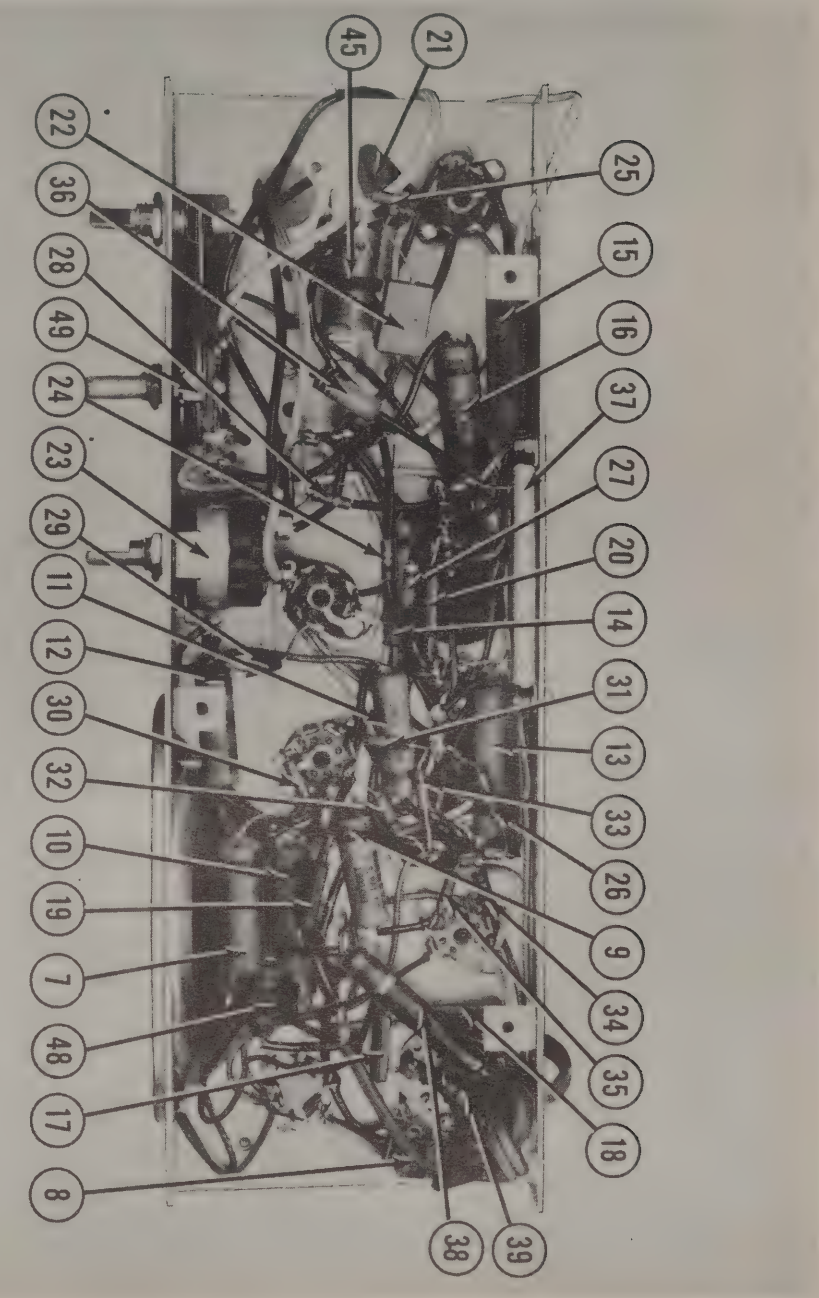
MISCELLANEOUS

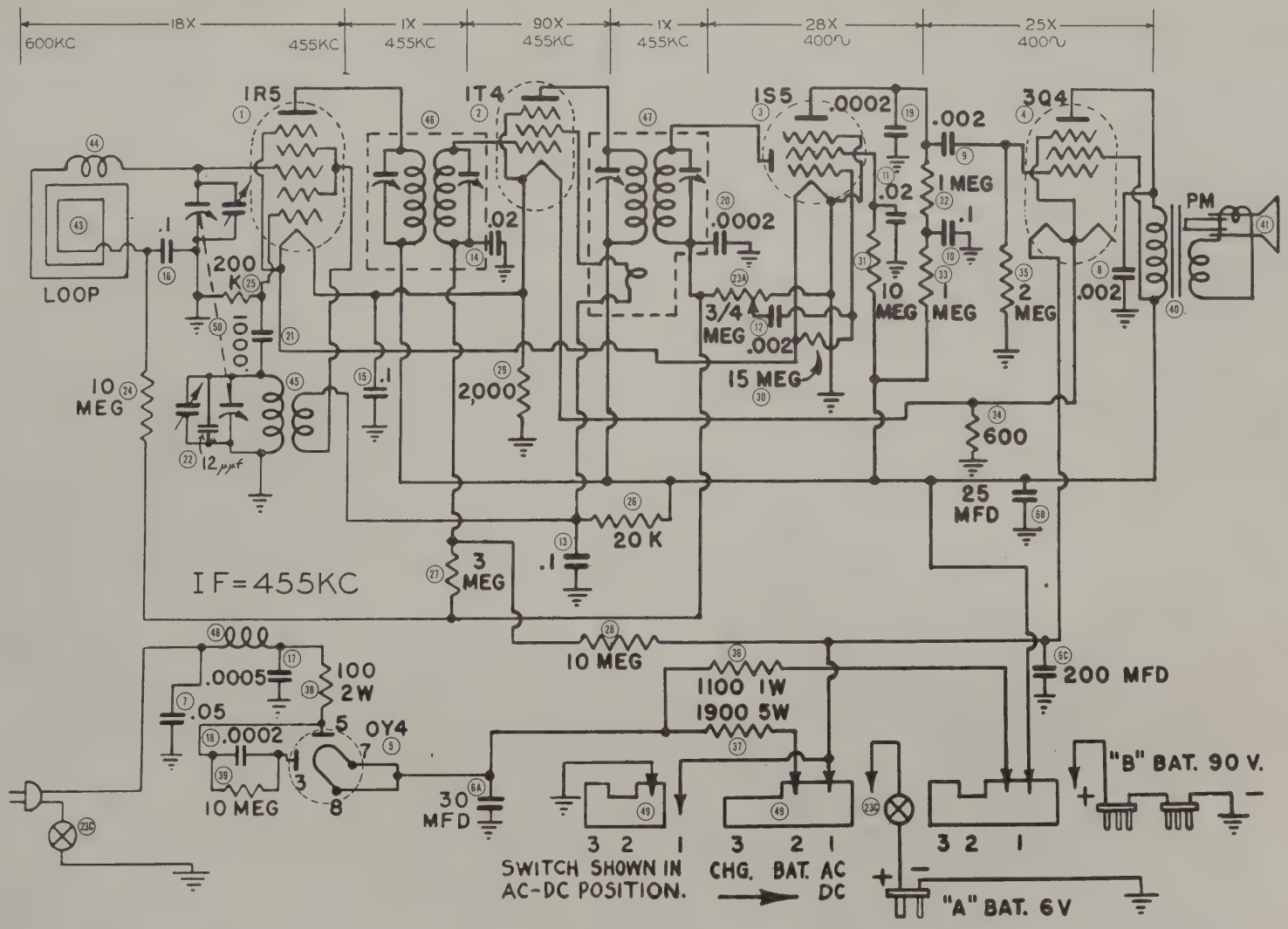
ITEM No.	PART NAME	AUTOMATIC PART No.	NOTES
49	Power Switch		
50	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	1R5	1.4V. DC	91V. DC	52V. DC	0V	1.4V. DC	0V	3V. DC	
2	1T4	3V. DC	91V. DC	52V. DC	0V	3V. DC	.02V. DC	4.1V. DC	
3	1S5	1.4V. DC	0V	0V	1.8V. DC	13.5V. DC	0V	0V	
4	3Q4	5.6V. DC	91V. DC	0V	96V. DC	4.1V. DC	91V. DC	4.1V. DC	
5	0Y4	0V	0V	51V. AC	0V	109V. AC	91V. DC	107V. DC	107V. DC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	1R5	*	2.8KΩ	22KΩ	205KΩ	*	10MEG	*	
2	1T4	*	2.8KΩ	22KΩ	I N F	*	2.4 MEG	*	
3	1S5	*	I N F	720KΩ	11MEG	1.7MEG	15MEG	*	
4	3Q4	*	3.6KΩ	2MEG	2.8KΩ	*	3.6KΩ	*	
5	0Y4	0Ω	I N F	I N F	I N F	I N F	3.6KΩ	1800Ω	1800Ω

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITORS

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

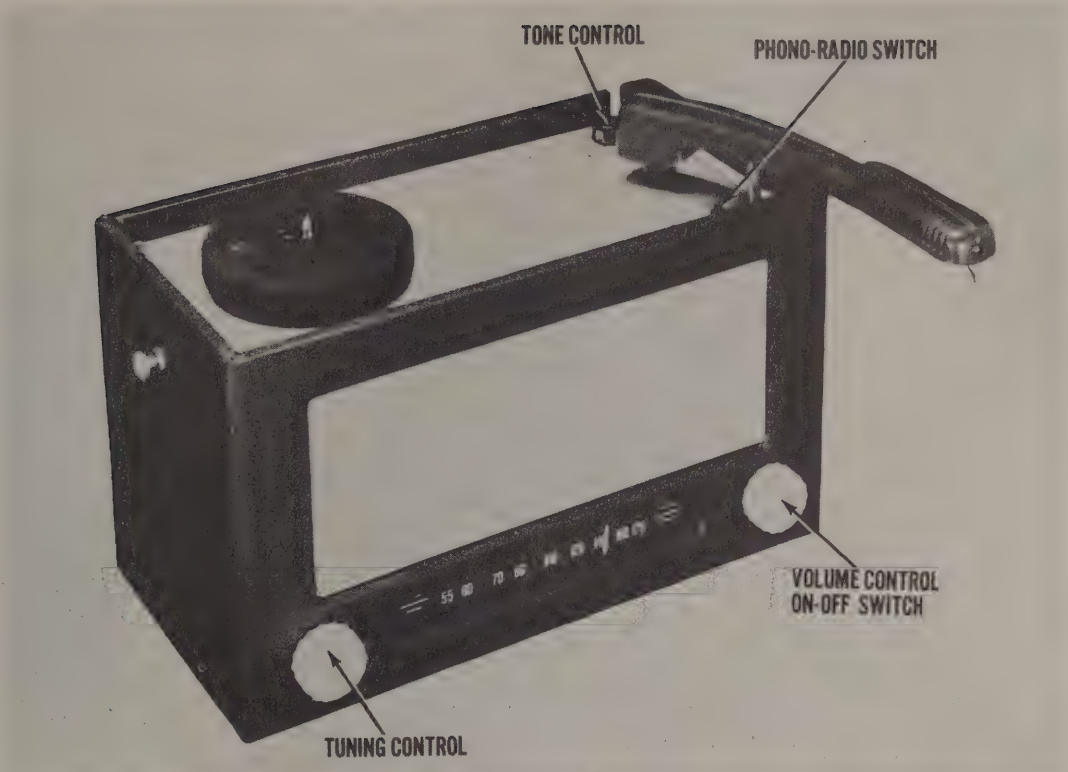
465-20

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SWANK
5 TUBE RADIO PHONO

SWANK
5 TUBE RADIO PHONO



SWANK
5 TUBE RADIO PHONO

TRADE NAME	Swank 5 Tube Radio-Phono
MANUFACTURER	Lindex Corp., 206 East 23rd St., New York, N.Y.
TYPE SET	AC Operated Combination Portable Phono-Superheterodyne Receiver, Self Contained Loop Antenna.
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volts AC RATING - .240 Amps. @ 117V AC
TUNING RANGE—BROADCAST	535-1650KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin 8 of 12SA7. Low side to chassis.	455KC	High freq.end of dial. (Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ant. lead. Low side to chassis.	1650KC	"	"	A5	Remove two screws with rubber mounting at each end of chassis. and tip phono motor and panel enough to permit alignment. Adjust for maximum output.
"	"	1400KC	Tune for maximum output.	"	A6	Adjust for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: SWANK PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SWANK PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	20	150		TN129	DSB-40+30+20-	TA-220	PRSA150-20-20	EZ42215	Filter - Blue
B	30	150			150	UT-301	PRS150-30		" - Red
C	20	150							" - Green
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.03	400		TP424	S-4-03	TC-13	484-03	DT4S3	Tone Compensation
9	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	50L6 Plate Bypass
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
12	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
13	.001	600		TP404	S-6-001	TC-21	684-001	DT6D1	Ant. Coupling
14	220	500		MC237	MO.5-32	1FM-32	1468-0002	5W5T2	Audio Plate Bypass
15	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
16	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
17	68	500		MC230	MOS.5-47	MS-47	1469-00007	5W5Q7	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SWANK PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
18A	500KΩ	1	650-504-E	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 18A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
19A	50KΩ	1	174054	MR35	D11-123	M-44-S	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 19A per instructions

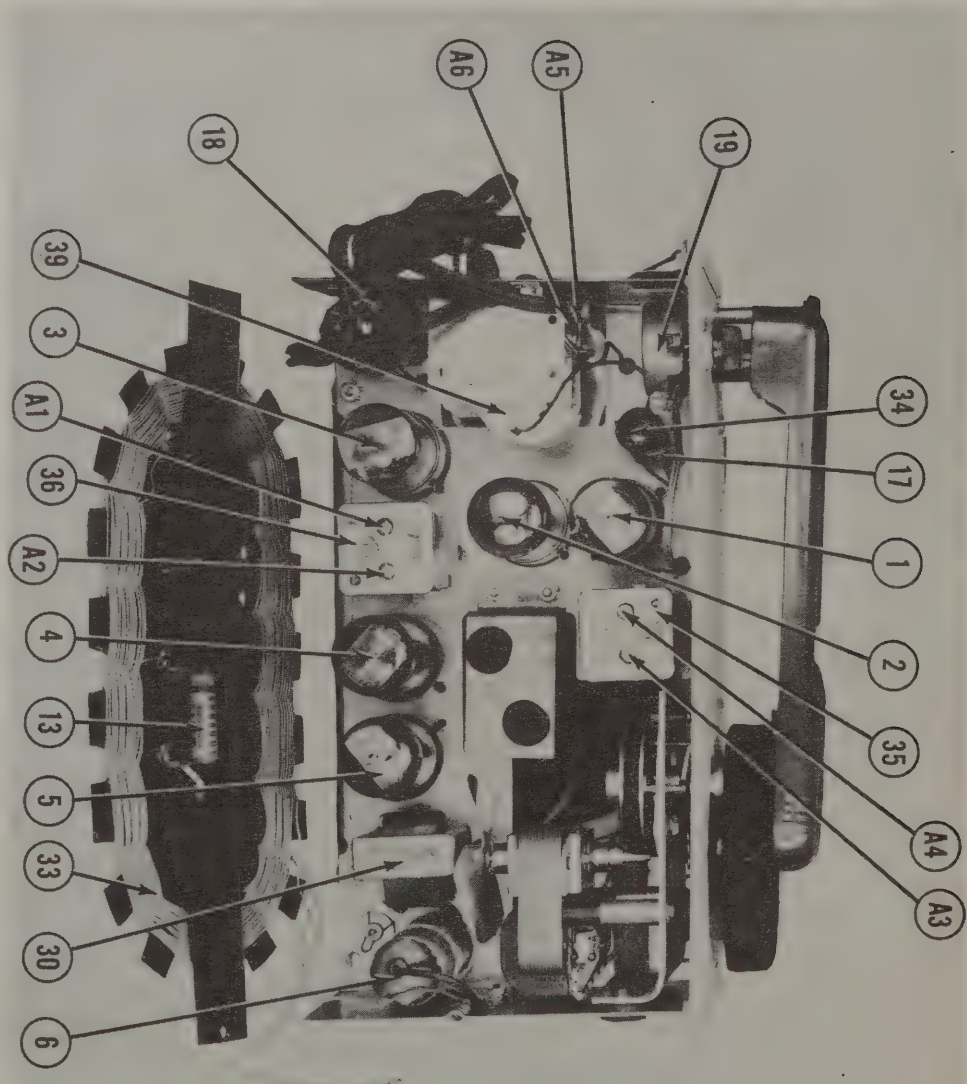
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SWANK PART No.	IRC PART No.	IDENTIFICATION CODES
20	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue AVC Network
21	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid Load
22	1.5 Meg.	½		BTS-1.5 Meg.	Br.-Grn.-Grn. AVC Network
23	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
24	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid Load
25	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
26	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
27	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
28	150Ω	1		BW-1-150	Br.-Grn.-Br. Filter
29	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SWANK PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
30	3300Ω	3.2Ω	230Ω	.75Ω		A-3876‡	T-22S45‡		‡Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA SWANK PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-105		
31	PM	3.2Ω		Mod. P5-X		
	CONE DIA.	VC DIA.				
32	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

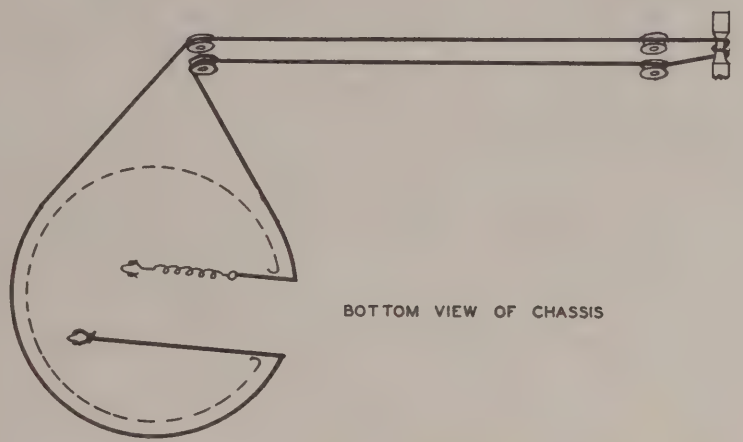
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SWANK PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
33	Loop Ant.	0Ω	1Ω			
34	Osc. Coil		6Ω		14-1040	
35	Input IF	20.3Ω	20.1Ω		16-6656	
36	Output IF	20Ω	20Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA SWANK PART No.		INSTALLATION NOTES
37	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

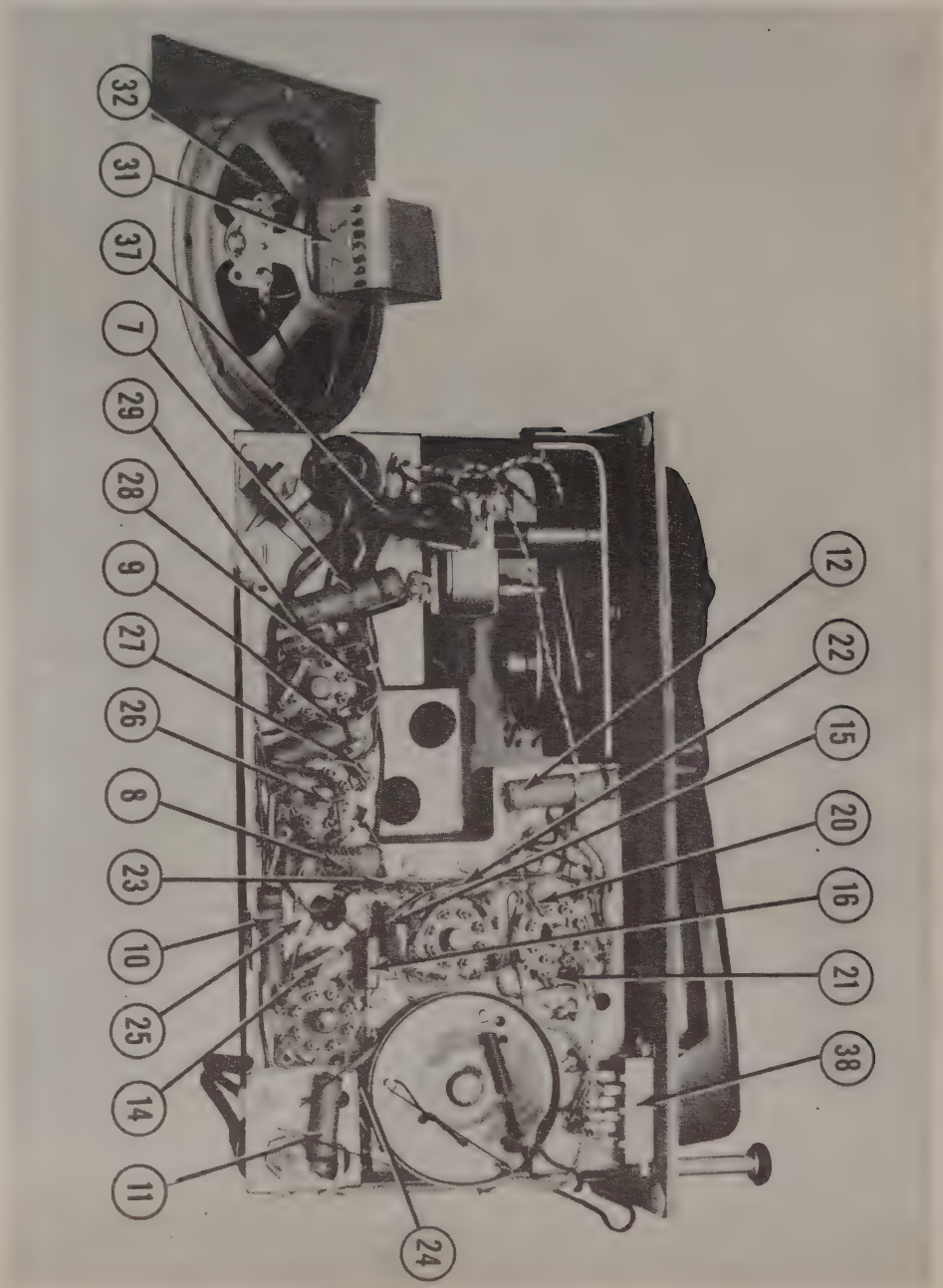
ITEM No.	PART NAME	SWANK PART No.	NOTES
38	Switch		Radio-Phono
39	Tuning Cap.		2 Gang Variable Cap.

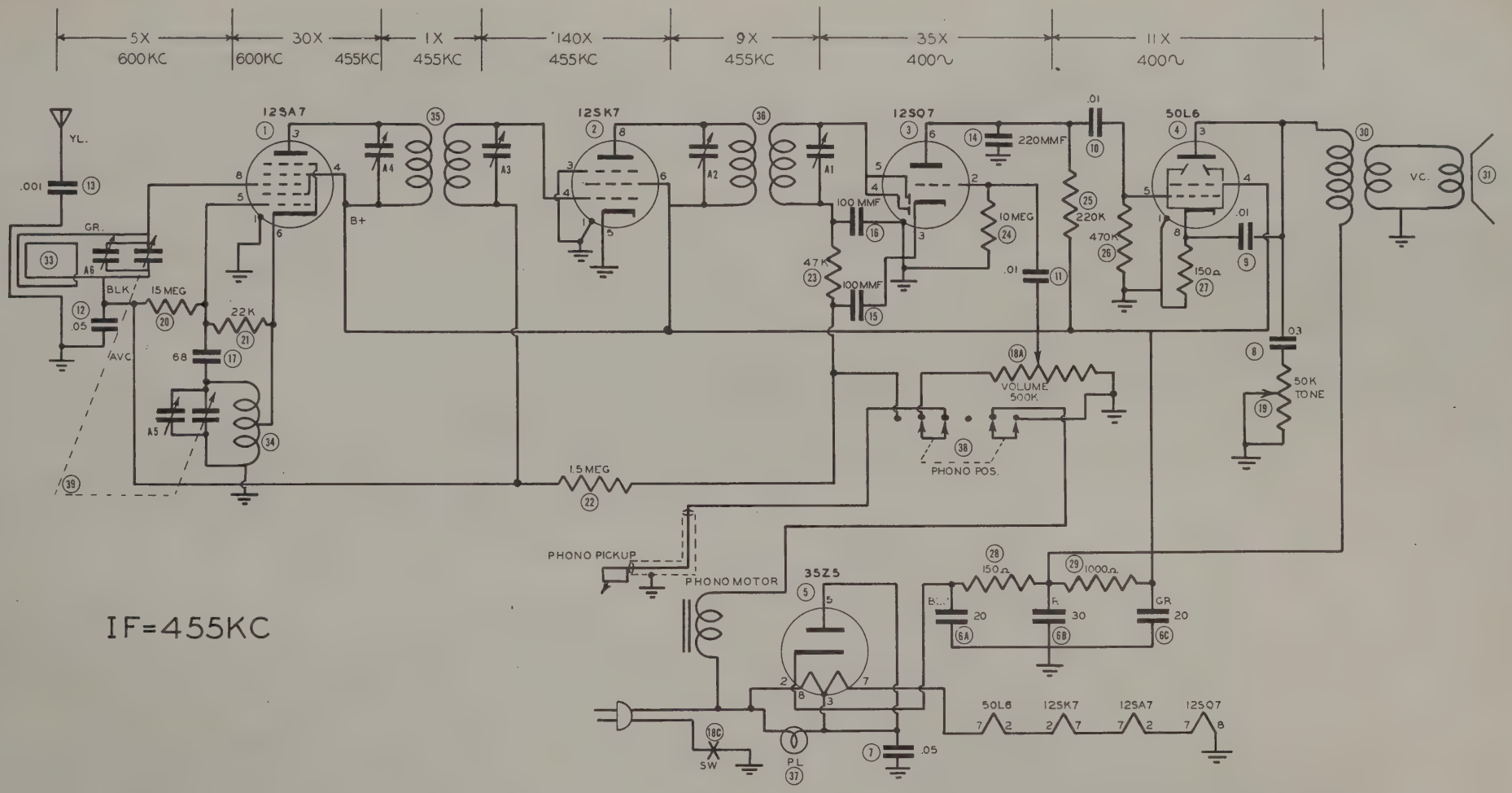


BOTTOM VIEW OF CHASSIS

DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	12 V. AC	87V. DC	87V. DC	-7.4V.DC	0 V	2.4.8VAC	-4V. DC
2	12SK7GT	0V	37.2VAC	0V	-4V. DC	0V	87V. DC	24.8VAC	87V. DC
3	12SQ7GT	0V	-.5V. DC	0V	-.55 V.DC	-.55V.DC	59V. DC	12V AC	0V
4	50L6GT	0V	37.2VAC	102V. DC	87V. DC	0V	0V	87VAC	5.4V. DC
5	35Z5GT	0V	117V. AC	113V. AC	87V. DC	113V. AC	109V. DC	87VAC	117V. DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	13Ω	100KΩ	100KΩ	24.5KΩ	.75Ω	26.5Ω	1.9 MEG
2	12SK7GT	0Ω	38Ω	0Ω	1.9 MEG	0Ω	100KΩ	26.5Ω	100KΩ
3	12SQ7GT	0Ω	8.5 MEG	0Ω	550KΩ	550KΩ	320KΩ	13Ω	0Ω
4	50L6GT	0Ω	38Ω	100KΩ	100KΩ	460KΩ	50KΩ	83Ω	150Ω
5	35Z5GT	0Ω	111Ω	108Ω	100KΩ	108Ω	100KΩ	83Ω	100KΩ

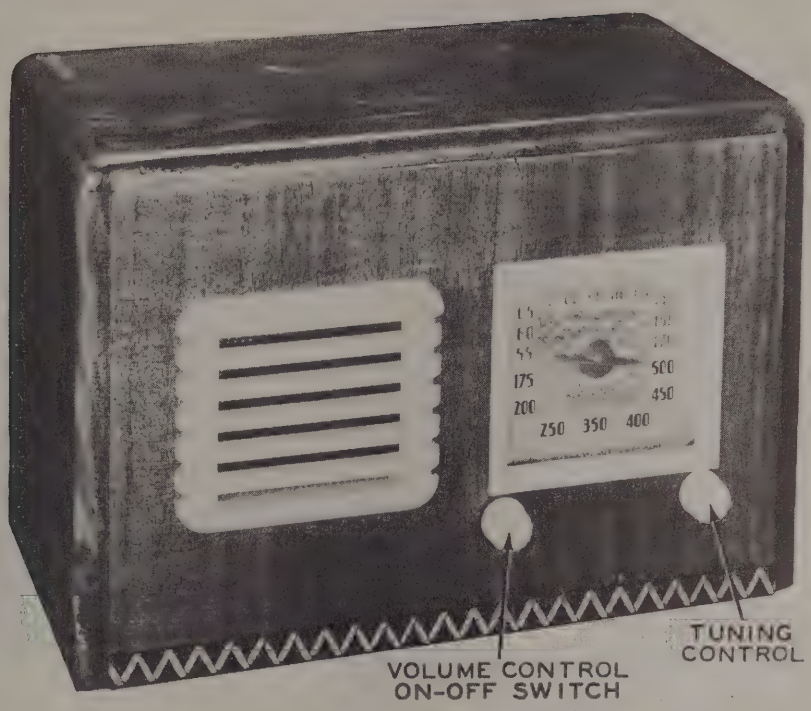
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-21

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

GENERAL TELEVISION
MODEL 17A5



GENERAL TELEVISION
MODEL 17A5

GENERAL TELEVISION MODEL 17A5

TRADE NAME	General Television Model 17A5
MANUFACTURER	General Television & Radio Corp., 2701 Lehmann St., Chicago, Ill.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC Rating .250 Amps. @ 117VAC
TUNING RANGE—BROADCAST	540-1720KC

ALIGNMENT INSTRUCTIONS

Before aligning receiver, fully close variable condenser and set pointer to mark at low freq. end of dial. Use isolating transformer if available. If not, connect capacitor in series with low side of generator to chassis. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1	High side to ant. section stator of variable. Low side to chassis.	455KC	High freq. end of dial. (Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
	Loop	1600KC	1600KC	"	A5	Connect 2 turns of wire to output of signal generator and radiate signal into loop antenna. Adjust for maximum output.
	"	1400KC	Tune for maximum output.	"	A6	"

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		GEN. TELEVISION PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	GENERAL TELEVISION PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
6A	40	150		FP306†	DY-40+20-150	EL-24	AF68D	UP4CJ59†	■ Filter
B	20	150							▲ "
7	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Line Bypass
8	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Line Isolating*
9	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	" "
12	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
13	250	500		MC240	M0.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
14	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	RF Bypass Diode
15	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor

*Not used in all models
†Do not use bypass section.

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	GEN. TELE. PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	500K	1	20-1(6154)	MR48	D13-133	A-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

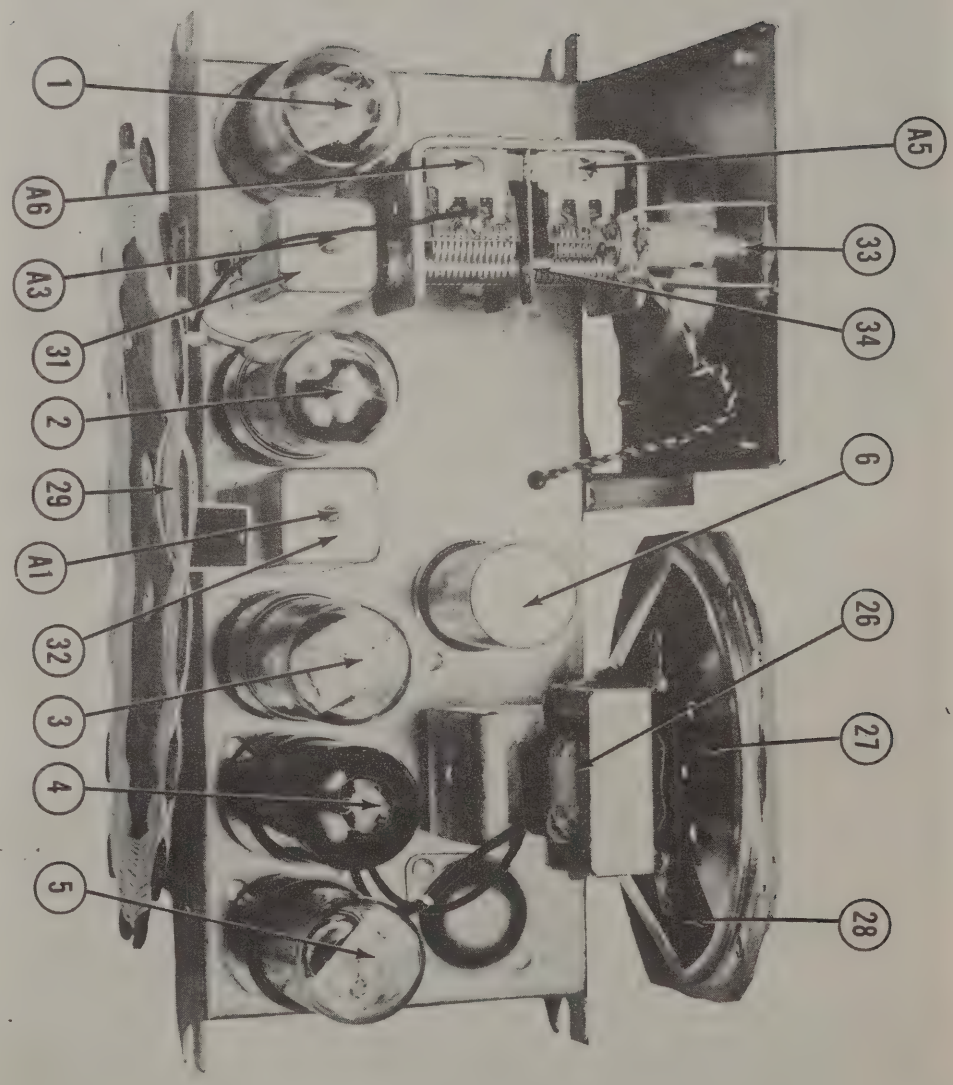
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	GEN. TELEV. PART No.	IRC PART No.	
17	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
18	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AVC Network
19	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. AVC Network
20	6 Meg.	½		BTS-5.6 Meg.	Blue-Blk.-Grn. 1st AF Grid
21	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
22	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
23	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
24	2000Ω	1		BTA-2200	Red-Blk.-Red Filter
25	10Ω	½		BW-½-10	Br.-Blk.-Blk. Rectifier Ballast

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		GEN. TELE. PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
26	4000Ω	3.2Ω	180Ω	.52Ω		A-3876	T-22[illegible]46‡		‡Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA GEN. TELEVISION PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-107		
27	PM	3.2Ω		Mod.P5-V		
	CONE DIA.	VC DIA				
28	4-9/16"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

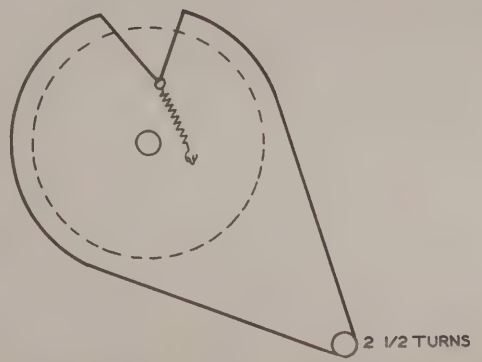
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA GEN. TELE. PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
29	Loop Ant.		1.5Ω			
30	Osc. Coil	1.5Ω	6Ω		14-1040	
31	Input IF	10Ω	10Ω		16-6668	
32	Output IF	10.5Ω	10Ω		16-6669	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA GEN. TELE. PART No.		INSTALLATION NOTES
33	Bayonet	6-8	0.15	Brown			Type 47

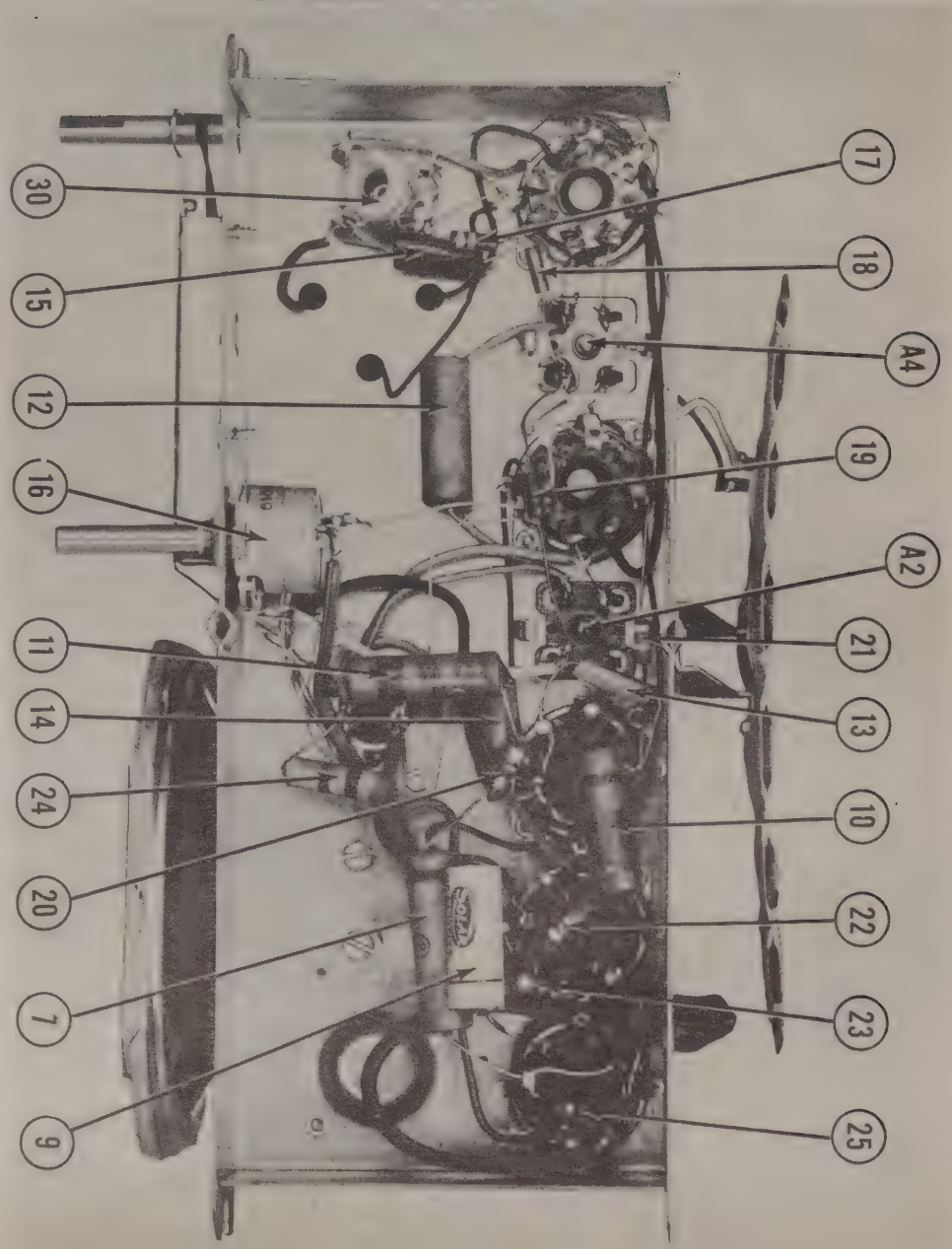
MISCELLANEOUS

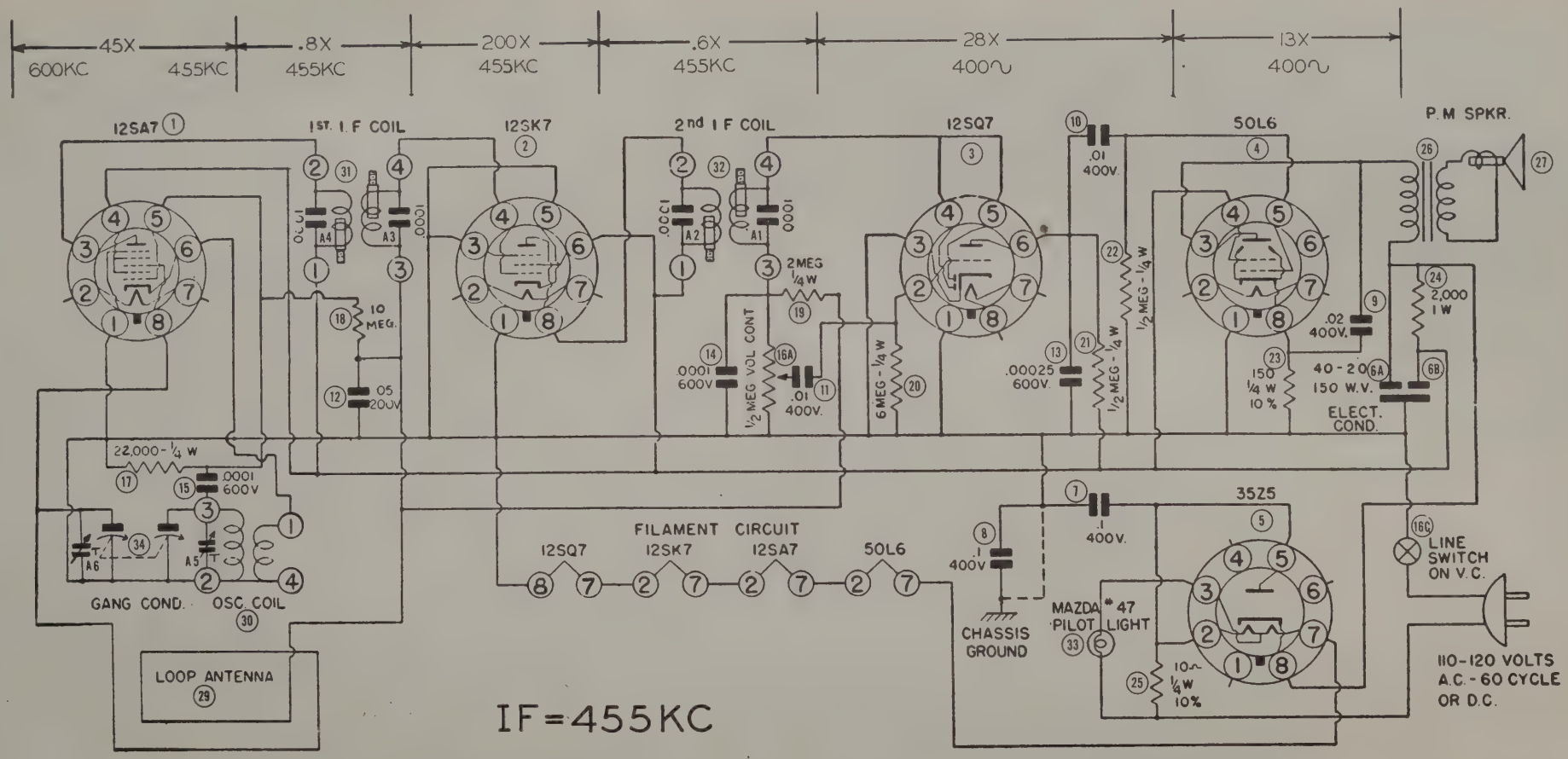
ITEM No.	PART NAME	GEN. TELEVISION PART No.	NOTES
34	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V.	24V.AC	80V.DC	80V.DC	-6.8V.DC	0V.	36.5V.AC	-7V.DC
2	12SK7GT	0V.	12.5V.AC	0V.	-7V.DC	0V.	80V.DC	24V.AC	80V.DC
3	12SQ7GT	0V.	-8V.DC	0V.	-45V.DC	-45V.DC	53V.DC	12.5V.AC	0V.
4	50L6GT	0V.	36.5V.AC	122V.DC	80V.DC	0V.	0V.	87V.AC	54V.DC
5	35Z5GT	0V.	117V.AC	114V.AC	0V.	117V.AC	117V.AC	87V.AC	127V.DC

RESISTANCE READINGS

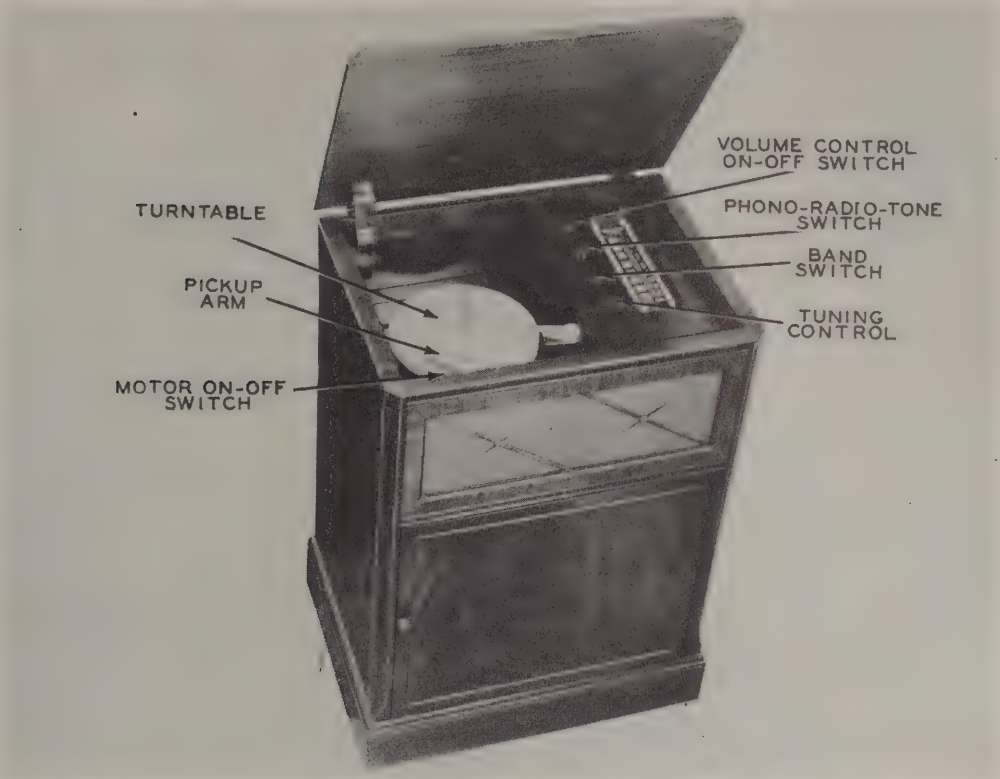
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0 Ω	23 Ω	40K Ω	40K Ω	25K Ω	.5 Ω	34 Ω	2.6MEG
2	12SK7GT	0 Ω	11.5 Ω	0 Ω	2.6MEG	0 Ω	40K Ω	23 Ω	40K Ω
3	12SQ7GT	0 Ω	6MEG	0 Ω	480K Ω	480K Ω	540K Ω	11.5 Ω	0 Ω
4	50L6GT	0 Ω	34 Ω	38K Ω	40K Ω	470K Ω	INF	79 Ω	140 Ω
5	35Z5GT	INF	114 Ω	109 Ω	INF	114 Ω	114 Ω	79 Ω	38K Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-22

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



BENDIX
MODELS 676B, 676C, 676D

BENDIX
MODELS 676B, 676C, 676D

BENDIX MODELS 676D

TRADE NAME	Bendix Models 676B, 676C, 676D
MANUFACTURER	Bendix Radio, Div. of Bendix Aviation Corp., Baltimore 4, Md.
TYPE SET	AC Operated Combination Auto. Phono. - Superheterodyne Receiver, Self Contained Loop Antenna.
TUBES (SIX)	Types, 6SK7 RF Amp., 6SA7 Converter, 6SK7 IF Amp., 6SQ7 Det.-AVC-AF, 6V6GT Power Output, 5Y3GT Rectifier.
POWER SUPPLY	105-125 Volts AC — RATING .490 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1620KC — **SHORT WAVE** 6-12 Megacycles

ALIGNMENT INSTRUCTIONS

To set pointer turn tuning control fully counterclockwise and fasten pointer to drive cord 2-3/4" from left end of dial backplate. All dial settings below are measured from the left end of dial back plate. Volume control at maximum volume and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #8 of 6SA7. Low side to chassis.	455KC	BC	High freq. end of dial (pointer at right end)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
200 MMF	High side to ant. post. Low side to chassis.	1475KC	"	7-3/4"	"	A5	" " " "
"	"	"	"	"	"	A6,A7.	" " " "
"	"	965KC	"	5-15/16"	"		Check calibration.
"	"	580KC	"	3-3/8"	"		" "
"	"	11MC	SW	7-3/4"	"	A8	Adjust for maximum output
"	"	11MC	"	"	"	A9	" " " "
"	"	9MC	"	9-9/16"	"		Check calibration.
"	"	6MC	"	3-1/2"	"		" " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: BENDIX PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SK7	6SK7	8N	
2	Converter	6SA7	6SA7	8R	
3	IF Amp.	6SK7	6SK7	8N	
4	Det.-AVC-AF	6SQ7	6SQ7	8Q	
5	Power Output	6V6GT	6V6GT	7AC	
6	Rectifier	5Y3GT	5Y3GT	5T	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: BENDIX PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	20	450	CE3A01	FP444*	DY-3x20-450	EL-420*	AF444J	UP9DJ56*	● Filter
B	20	450							■ "
C	20	450							▲ "
8	.005	600	CP6T18	TP408	S-6-005	TC-25	684-005	DT6D5	Line Bypass
9	.006	600	CP6T20	TP409	S-6-006	TC-26	684-006	DT6D6	6V6 Plate Bypass
10	.02	400	CP4T34	TP423	S-4-02	TC-12	484-02	DT4S2	Audio Coupling
11	.006	600	CP6T20	TP409	S-6-006	TC-26	684-006	DT6D6	Audio Coupling
12	.006	600	CP6T20	TP409	S-6-006	TC-26	684-006	DT6D6	Audio Coupling
13	.2	200	CP2T56	TP429	S-4-2	TC-2	484-.2	DT4P2	Tone Compensation
14	.05	400	CP4T40	TP426	S-4-05	TC-15	484-05	DT4S5	IF Cath. Bypass ‡
15	.02	400	CP4T34	TP423	S-4-02	TC-12	484-02	DT4S2	AVC Filter
16	.05	400	CP4T40	TP426	S-4-05	TC-15	484-05	DT4S5	Screen Bypass
17	.02	400	CP4T34	TP423	S-4-02	TC-12	484-02	DT4S2	AVC Filter
18	.02	400	CP4T34	TP423	S-4-02	TC-12	484-02	DT4S2	" "
19	.1	200	CP2T51	TP428	S-4-1	TC-1	484-.1	DT4P1	RF Cath. Bypass
20	.05	400	CP4T40	TP426	S-4-05	TC-15	484-05	DT4S5	RF Bypass Pwr. Supp.
21	100	500	CM5A22	MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Feedback
22	100	500	CM5A22	MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Audio Plate Bypass
23	1000	500	CM5A46	MC255	M0.3-21	1FM-21	1468-001	1W5D1	Tone Compensation
24	47	500	CM5A14	MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor
25	8200	300	CM3E00						Fixed Padder
26	470	500	CM8S50						RF Padder SW
27	3.3	500	CC9A16						RF Coupling
28	47	500	CM5A14	MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Fixed Trimmer
29	220	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Loop Pri. Shunt

*Do not use last section of capacitor
‡Not used in all models.

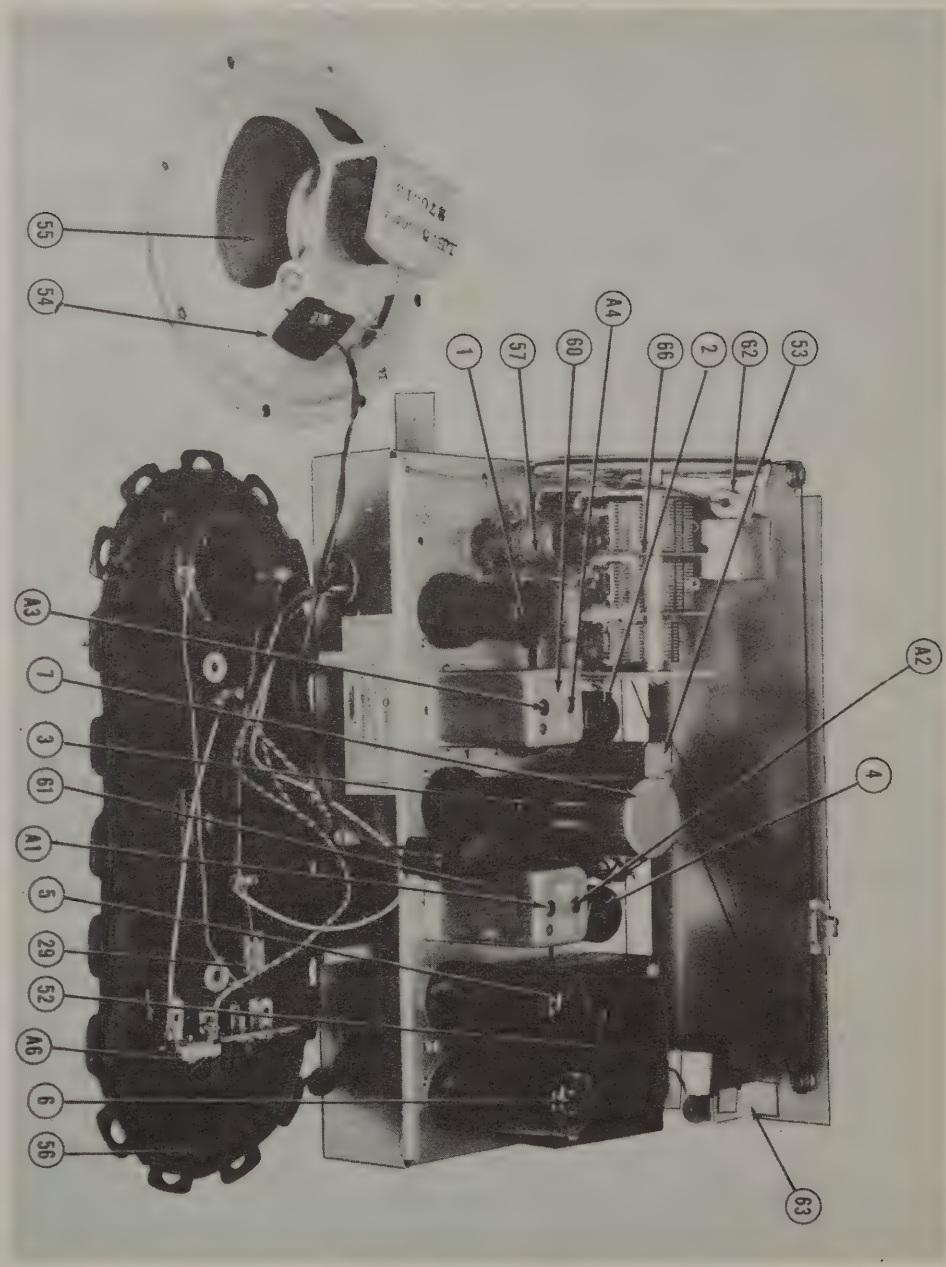
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
30A	1 Meg.	1	RV0S01	MR53	D13-137	M-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 30A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: BENDIX PART No.	IRC PART No.	IDENTIFICATION CODES
31	270Ω	½	RC3C17	BW-½-270	Red-Vi.-Br. RF Cathode ‡
32	1 Meg.	½	RC1H62	BTS-1 Meg.	Br.-Blk.-Grn. Converter Grid
33	1 Meg.	½	RC1H62	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
34	2.2 Meg.	½	RC1H66	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
35	22KΩ	½	RC1G40	BTS-22K	Red-Red-Or. Osc. Grid
36	470Ω	½	RC1H20	BTS-470	Yl.-Vi.-Br. Mixer Cathode
37	220KΩ	½	RC1H54	BTS-220K	Red-Red-Yl Bleeder ‡
38	470Ω	½	RC1H20	BTS-470	Yl.-Vi.-Br. IF Cathode ‡
39	150Ω	½	RC1G14	BW-½-150	Br.-Grn.-Br. IF Cathode ‡

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONTINUED)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	BENDIX PART No.	IRC PART No.	
40	10KΩ	2	RC4G72	BT-2-10K	Br.-Blk.-Or. IF Screen Dropping
41	220KΩ	½	RC1H54	BTS-220K	Red-Red-Yl. RF - IF Cathode
42	100KΩ	½	RC1H51	BTS-100K	Br.-Blk.-Yl. Phono Series
43	470KΩ	½	RC1H58	BTS-470K	Yl.-Vi.-Yl. Diode Load
44	10 Meg.	½	RC1H74	BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
45	220KΩ	½	RC1H54	BTS-220K	Red-Red-Yl. 1st AF Plate Load
46	1000Ω	½	RC1G24	BTS-1000	Br.-Blk.-Red Feedback
47	4700Ω	½	RC1G32	BTS-4700	Yl.-Vi.-Red Feedback
48	470KΩ	½	RC1H58	BTS-470K	Yl.-Vi.-Yl. Output Grid
49	270Ω	½	RC3C17	BW-½-270	Red-Vi.-Br. Output Cathode
50	100Ω	2	RC4G12	BT-2-100	Br.-Blk.-Br. Filter
51	1500Ω	2	RC4G26	BT-2-1500	Br.-Grn.-Red "

Not used in all models.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA			
	PRI.	SEC. 1	SEC. 2	SEC. 3	BENDIX PART No.	STANCOR PART No.	THORDARSON PART No.	
52	117VAC @ .490A	550VCT @ .070A	5.1VAC @ 1.9A	6.4VAC @ 1.9A	TP0F00	P-6120†	T13R20	†Use universal mounting brackets supplied with this unit.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BENDIX PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
53	10000Ω	3.06Ω	285Ω	.4Ω	TA0002		T14S85		

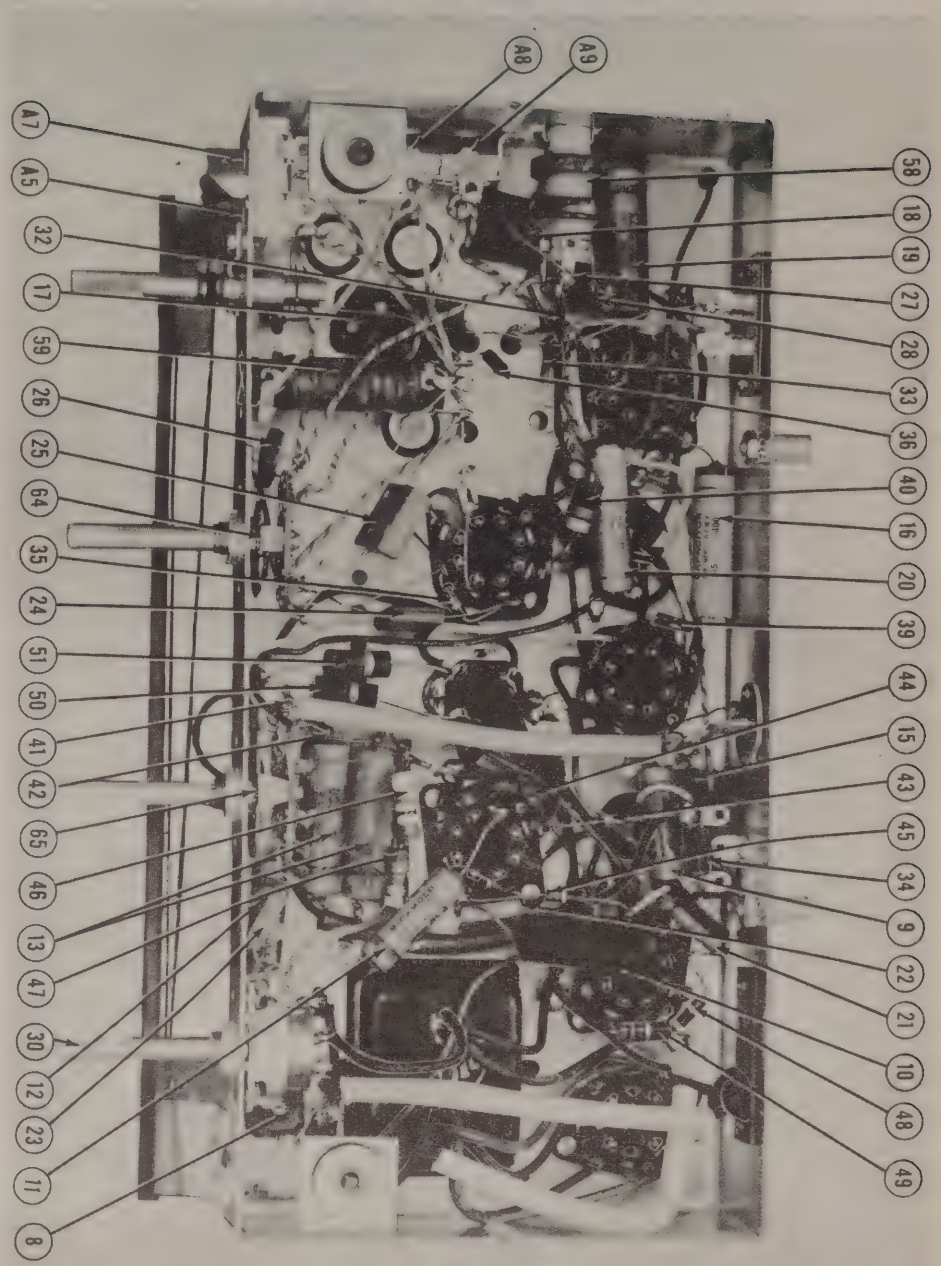
SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			BENDIX PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-110		
54	PM	3.06Ω	SP6R00	Mod. P6-V		
	CONE DIA.	VC DIA.				
55A	5-7/8"	3/4"	CS6R02			Cone and VC Assembly for Code 270
55B			CS6R00			" " " " " " 285
55C			CS6R01			" " " " " " 159
55D			CS6R03			" " " " " " 258
55E			CS6R04			" " " " " " 191
55F			CS6R05			" " " " " " 188
55G			CS6R06			" " " " " " 371

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	BENDIX PART No.	MEISSNER PART No.	
56	Loop Ant.	22Ω	.5Ω	AL0Z00		
57	SW Ant.Coil	2Ω	0Ω	TR6C00	14-1044	
58	BC RF "	57Ω	3.5Ω	TR6L01	14-1027	
59A	BC Osc. "		6Ω	L06G00		Items 59A, 59B wound on same coil-form
59B	SW " "		.1Ω	L06G00		
60	Input IF	30Ω	30Ω	TI0C02	16-6658	
61	Output IF	29Ω		T10D02	16-6670	

CHASSIS—BOTTOM VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA BENDIX PART No.		INSTALLATION NOTES
62	Bayonet	6-8	0.15	Brown			Type 47
63	"	6-8	0.15	Brown			" "

MISCELLANEOUS

ITEM No.	PART NAME	BENDIX PART No.	NOTES
64	Band Switch	SR2B00	
65	Switch	SR6C00	Radio-Phono-Tone
66	Tuning Cap.	CV0C01	3 Gang Variable Cap.
A5	Trimmer	CT2A03	Osc. Adj. 2-20 MMF
A6	Trimmer	CT2A03	RF Adj. 2-20 MMF
A7	Trimmer	CT2A03	Ant. Adj. 2-20 MMF
A8	Trimmer	CT2A02	SW Osc. Adj. 3-30 MMF
A9	Trimmer	CT2A02	SW Ant. Adj. 3-30 MMF
	Dial Back Plate	AD0C05	Assembly
	Spring	HS0C00	Cable Tension
	Dial Indicator	ID0L00	Lucite
	Jack-Plug	JP2M00	2 Contacts
	Jack Receptacle	JR1S00	1 "
	Jack Receptacle	JR2S03	2 "
	Jack Receptacle	JR4S00	4 "
	Tuning Shaft	MS0T03	
	Dial Glass	DS0C02	2 Band
	Retainer-Dial	DX0R05	Metal
	Decal-Functional	DZ0F03	Panel
	Ring-Knob	HK0R00	Retainer Spring
	Jack Plug	JP4M00	4 Contacts
	Jack Receptacle	JR2S01	2 "
	Knob	KZ0S00	Door Cabinet
	"	KC0B06	Control-Models 676B & D
	"	KB0B01	" Indexed Models 676 B & D
	Cabinet	ZW6G01	Consolette (Walnut) 676B
	Knob	KB0B02	Indexed (Brown) Model 676 C
	"	KC0B07	Control " " "
	Cabinet	ZW6G02	Consolette (Knotty Pine) 676 C
	"	ZW5G00	" (Mahogany) 676 D

DISASSEMBLY INSTRUCTIONS

1 - Remove the following push-on type knobs: Volume Control, Radio-Phono, Band Switch, Tuning Control.

2 - Disconnect speaker plug, phono-pickup plug and antenna plug from chassis.

3 - Remove 4 chassis bolts from cab. (two from bottom, two from top)

4 - Unsolder black phono-motor lead connecting switch of volume control.

5 - Unsolder white phono-motor lead connecting line.

6 - Remove dial light paper held by three paper clips to cabinet at side of dial.

7 - Remove chassis and chassis brackets.

8 - Remove two screws holding antenna loop to cabinet.

9 - Unsolder cab. loop white wire from antenna loop coupling lug.

10- Remove antenna.

11- Remove speaker from cabinet. (four nuts and 4 lock washers.)

VOLTAGE READINGS

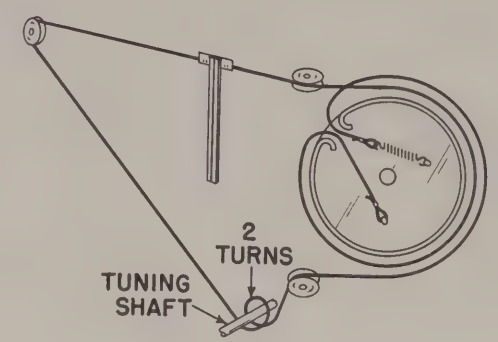
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0 V.	6.4V.AC	3V.DC	0 V.	3V.DC	93V.DC	0V.	213V.DC
2	6SA7	0 V.	6.4 VAC	213V.DC	93V.DC	-4.6VDC	0 V.	0 V.	-1V.DC
3	6SK7	0 V.	6.4VAC	0V.	0V.	3V.DC	93V.DC	0 V.	213V.DC
4	6SQ7	0 V.	-4V.DC	0 V.	-2V.DC	0V.	100V.DC	0 V.	6.4V.AC
5	6V6GT	0 V.	6.4V.AC	247VDC	213V.DC	0 V.	0 V	0 V.	12V.DC
6	5Y3GT	0 V.	265V.DC	0 V.	270V.AC	0 V.	270V.AC	0 V.	265V.DC

NOTE: VOLTAGE & RESISTANCE MEASUREMENTS WERE TAKEN IN STANDARD BROADCAST POSITION TONE CONTROL IN 3 POSITION

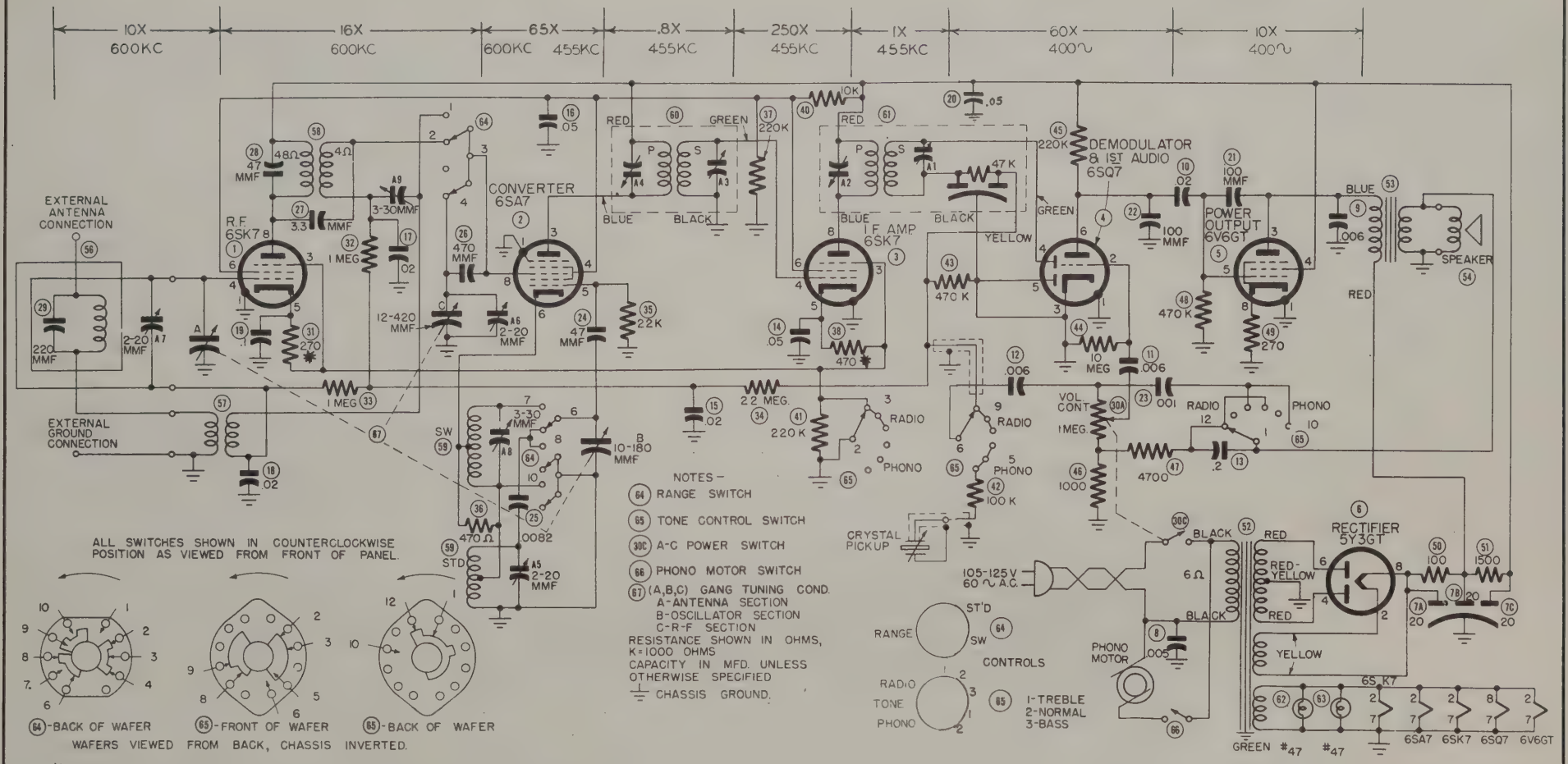
RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SK7	0 Ω	.12 Ω	150 Ω	3.7MEG	150 Ω	170K Ω	0 Ω	160K Ω
2	6SA7	0 Ω	.12 Ω	160K Ω	170K Ω	23K Ω	.5 Ω	0 Ω	3.7MEG
3	6SK7	0 Ω	.12 Ω	0 Ω	28 Ω	150 Ω	170K Ω	0 Ω	160K Ω
4	6SQ7	0 Ω	11MEG	0 Ω	500K Ω	0 Ω	380K Ω	0 Ω	.12 Ω
5	6V6GT	0 Ω	.12 Ω	160K Ω	160K Ω	470K Ω	1NF	0 Ω	270 Ω
6	5Y3GT	0 Ω	160K Ω	1NF	135 Ω	1NF	142 Ω	1NF	160K Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.



DIAL CORD DRIVE



IF=455KC

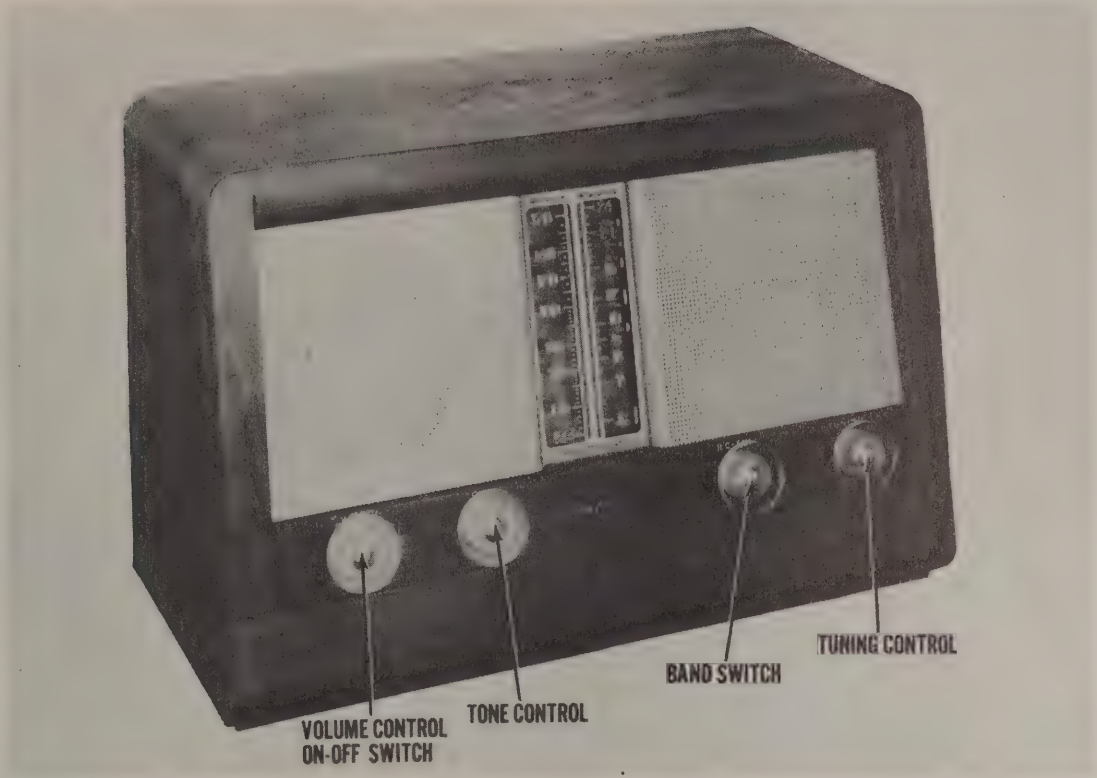
✱NOTE: IN SOME MODELS THE CATHODES OF THE RF & IF STAGES ARE CONNECTED TOGETHER & THROUGH A 150Ω RESISTOR TO THE SUPPRESSOR GRID OF THE IF STAGE AND TO THE 220KΩ RESISTOR ON THE PHONO-RADIO SWITCH. ON THESE MODELS, ITEMS 31 & 38 ARE OMITTED.

465-23

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



PILOT MODEL T-511

TRADE NAME	Pilot Model T-510, T-511
MANUFACTURER	Pilot Radio Corp., 37-06 36th Street, Long Island City, N.Y.
TYPE SET	AC-DC 2 Band Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types 12SK7 RF Amp., 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 35L6GT or 50L6GT Power Output, 35Z5GT Rectifier.

POWER SUPPLY 100-125 Volts AC-DC — RATING .30 Amps. @ 117V AC
TUNING RANGE—BROADCAST 535-1720KC — **SHORT WAVE** 5.67-24.0 MC

ALIGNMENT INSTRUCTIONS

"Loop Ant.-Outside Ant." switch on backplate in outside ant. position unless stated otherwise. Use isolating transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control in maximum volume position and signal from signal generator no stronger than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to grid of 12SK7 RF. Low side to chassis.	455KC	BC	Low freq.end of dial.(Gang fully closed)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
400 ohms	High side to ant. post. Low side to chassis.	21MC	SW	Top mark on dial back-plate.	"	A5	" " " "
"	"	"	"	"	"	A6	" " " "
200 MMF	"	1400KC	BC	Second from top mark on dial back-plate.	"	A7	" " " "
"	"	600KC	"	Third mark from bottom on dial back-plate.	"	A8	Adjust for maximum output Recheck A7.
"	"	1400KC	"	Tune for maximum output.	"	A9	Adjust for maximum output
"	"	"	"	"	"	A10	Change loop-outside ant. switch on back plate to loop position and adjust for maximum output. Connect signal generator to loop of few turns of wire and radiate signal into set.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: PILOT PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SK7	12SK7	8N	
2	Converter	12SA7	12SA7	8R	
3	IF Amp.	12SK7	12SK7	8N	
4	Det.-AVC-AF	12SQ7	12SQ7	8Q	
5A	Power Output	50L6GT	50L6GT	7AC	Model T511
B	Power Output	35L6GT	35L6GT	7AC	Model T510
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: PILOT PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7	40	250	24-40	TC78	M-40-350	UT-402	PRS450-40	BR4025	Filter
8	40	250	24-40	TC78	M-40-350	UT-402	PRS450-40	BR4025	"
9	.05	600	22-31	TP415	S-6-05	TC-15	684-05	DT6S5	Line Filter
10	.05	200	22-28	TP426	S-4-02	TC-15	484-05	DT4S5	Bias Filter
11	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	Filament Bypass
12	.25	400	22-40	TP430	S-4-25	TC-2	484-.25	DT4P25	Tone Compensation
13	.01	600	22-18	TP410	S-6-01	TC-11	684-01	DT6S1	35L6 Plate Bypass
14	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
15	.005	600	22-10	TP408	S-6-005	TC-25	684-005	DT6D5	" "
16	.05	400	22-30	TP426	S-4-05	TC-15	484-05	DT4S5	IF Screen Bypass
17	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	Line Isolating
18	.05	200	22-25	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
19	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	Conv. Screen Bypass
20	.05	400	22-30	TP426	S-4-05	TC-15	484-05	DT4S5	Osc. Feedback
21	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	RF Screen Bypass
22	.05	400	22-30	TP426	S-4-05	TC-15	484-05	DT4S5	RF Cath. Bypass
23	.05	400	22-30	TP426	S-4-05	TC-15	484-05	DT4S5	Line Isolating
24	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	AVC Filter
25	.01	400	22-17	TP421	S-4-01	TC-11	484-01	DT4S1	AVC Filter SW
26	.005	600	22-11	TP408	S-6-005	TC-25	684-005	DT6D5	Ant. Coupling-SW
27	400	500	20-27	MC243	MO.5-34	1FM-34	1468-0004	5W5T4	Audio Plate Bypass
28	100	500	20-14	MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Tone Compensation
29	250	500	20-22	MC240	MO.5-325	1FM-325	1468-00025	5W5T25	RF Bypass Diode
30	250	500	20-22	MC240	MO.5-325	1FM-325	1468-00025	5W5T25	Osc. Grid Capacitor
31	250	500	20-22	MC240	MO.5-325	1FM-325	1468-00025	5W5T25	RF Coupling
32	40	500	20-11	MC223	MO.5-44	1FM-44	1468-00004	5W5Q4	Ant. Coupling
68	25	500	20-6	MC220	MO.5-425	MS-425	1468-000025	5W5Q25	Diode Coupling

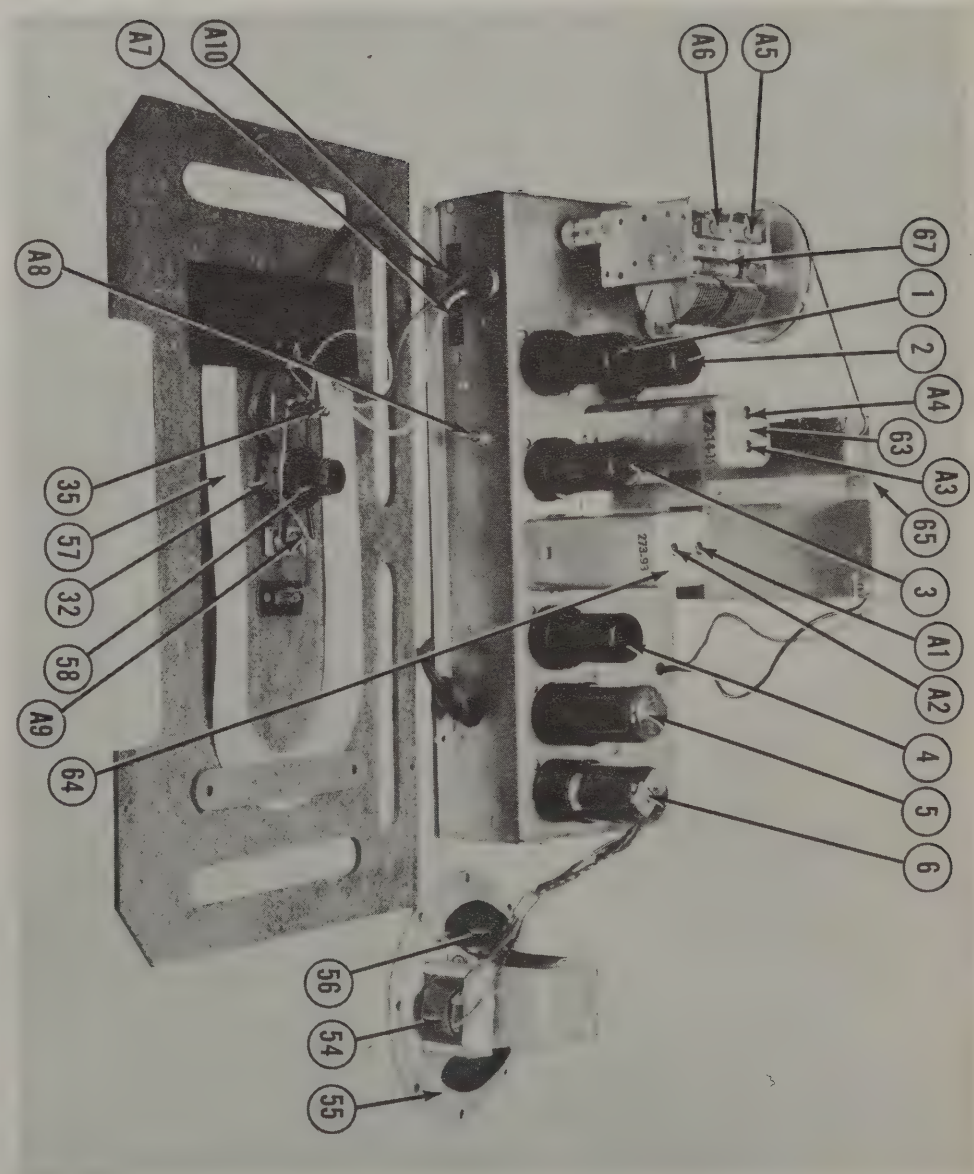
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PILOT PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
33A	500KΩ	1	36-5	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 33A per instructions.
C	Switch		" "	M26	41	SW-A	" " " " "
34A	10KΩ	1	37-14	MR18	D13-116	M-81-Z	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 34A per instructions.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: PILOT PART No.	IRC PART No.	IDENTIFICATION CODES
35	68KΩ	½	30-268	BTS-68K	Blue-Gray-Or. Ant. Loading
36	220KΩ	½	30-271	BTS-220K	Red-Red-Yl. RF Grid
37	150Ω	½	31-81	BW-½-150	Br.-Grn.-Br. RF Cathode
38	270KΩ	½	30-323	BTS-270K	Red-Vi.-Yl. Line Isolating
39	2200Ω	½	30-380	BTS-2200	Red-Red-Red RF Plate Load
40	4700Ω	½	30-399	BTS-4700	Yl.-Vi.-Red Converter Grid
41	220KΩ	½	30-271	BTS-220K	Red-Red-Yl. AVC Network
42	22KΩ	½	30-266	BTS-22K	Red-Red-Or. Osc. Grid
43	150Ω	½	31-81	BW-½-150	Br.-Grn.-Br. Osc. Tuned Circuit
44	2.2 Meg.	½	30-278	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
45	2.2 Meg.	½	30-278	BTS-2.2 Meg.	Red-Red-Grn. " "
46	47KΩ	½	30-267	BTS-47K	Yl.-Vi.-Or. Diode Load

CHASSIS—TOP VIEW



CUT ON THIS LINE—MOISTEN EDGE—AND APPLY TO PROPER FOLDER

PILOT - MODELS T-510, T-511

Page 3 - Item 40 STANCOR Part Listing should be A3876†. Add Installation Note - "†Add filter to reduce hum level."

Page 3 - Item 41 JENSEN Part Listing should be ST-107 Mod. P5-V.

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (CONTINUED)

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	PILOT PART No.	IRC PART No.	
47	3.9 Meg.	½	30-375	BTS-3.9 Meg.	Or.-White-Grn. 1st AF Grid
48	330KΩ	½	30-295	BTS-330K	Or.-Or.-Yl. 1st AF Plate Load
49	470KΩ	½	30-274	BTS-470K	Yl.-Vi.-Yl. Output Grid
50	47Ω	½	31-40	BW-½-47	Yl.-Vi.-Blk. Fixed Bias
51	47Ω	½	31-40	BW-½-47	Yl.-Vi.-Blk. Fixed Bias
52	10Ω	½	31-84	BW-½-10	Br.-Blk.-Blk. Surge Limiter
53	600Ω	7	31-80	AB-680	Series Pilot Light

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		PILOT PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
54	3720Ω	3.5Ω	240Ω	.35Ω	TA0002	A-3876	T-13S39		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			PILOT PART No.	JENSEN PART No.		
	FIELD RES.	VC IMP.		ST-250		
55	350Ω	3.5Ω	40-26	Mod. H5-S		
	CONE DIA.	VC DIA.				
56	4-9/16"	5/8"	NOT READILY REPLACEABLE - USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	PILOT PART No.	MEISSNER PART No.	
57	Loop Ant.		1Ω	284-23		
58	BC Ant.Coil	32Ω	0Ω		14-1026	
59	SW " "	1.5Ω	.2Ω	70-54	14-1044	
60	Peaking "	1Ω		75-12		
61A	BC Osc. "	.5Ω	2Ω	72-45		Items 61A, 61B wound on same form
B	SW " "		0Ω	72-45		
62	Osc.Cath."	1.8Ω		75-11		
63	Input IF	11Ω	10.5Ω	273-14	16-6658	
64	Output "	8.5Ω	8Ω	273-93	16-6660	

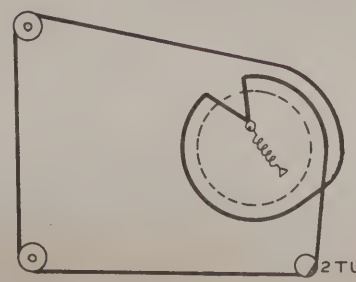
DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					PILOT PART No.		
65	Screw	110	.05				Type C-7 frosted glass

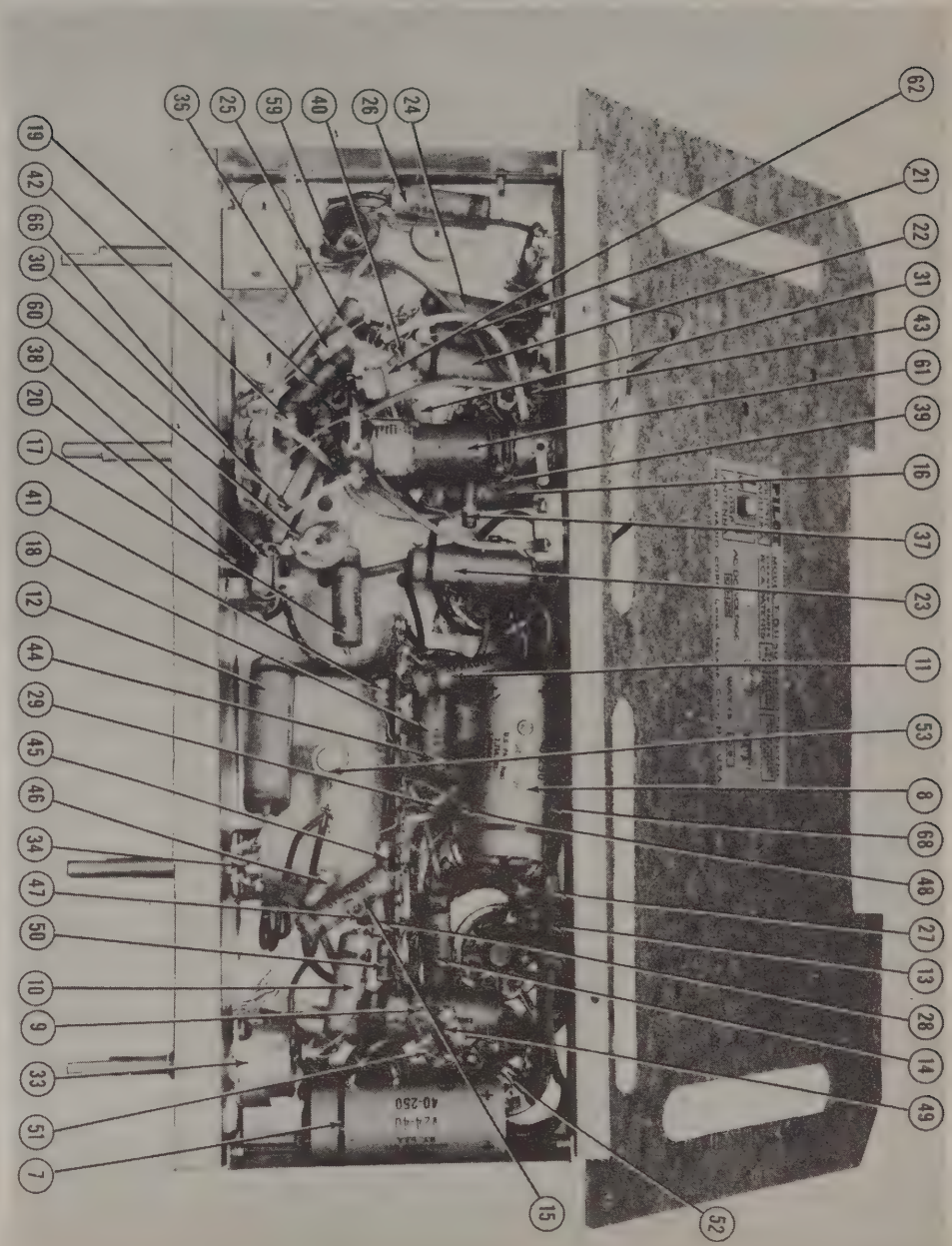
MISCELLANEOUS

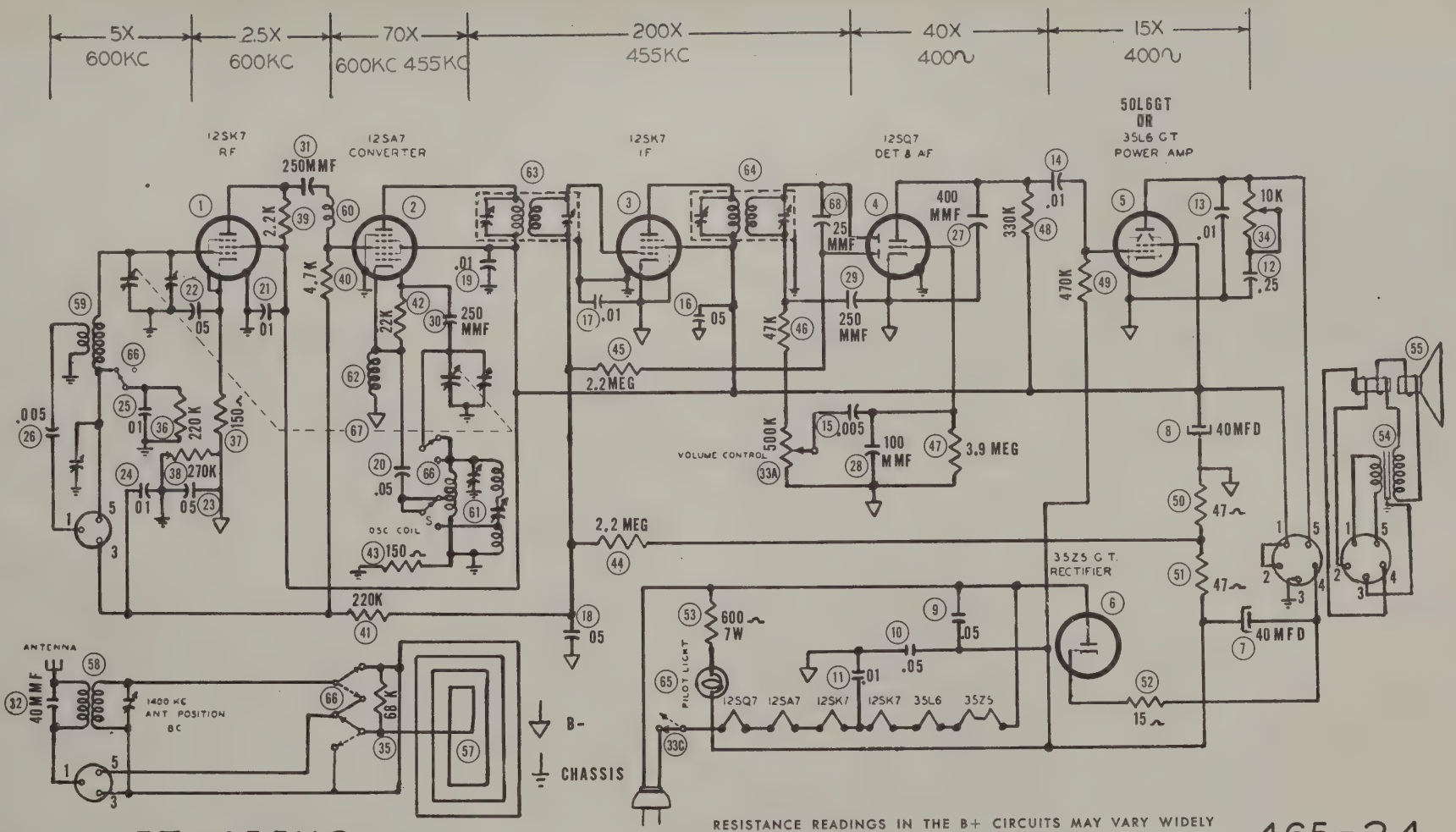
ITEM No.	PART NAME	PILOT PART No.	NOTES
66	Band Switch		
67	Tuning Cap.		2 Gang Variable Cap.

DIAL CORD DIAGRAM



CHASSIS—BOTTOM VIEW





IF=455KC

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-24

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	0V	33.5VAC	1.1V. DC	-.2V. DC	1.1V. DC	94V. DC	22.5VAC	83 V. DC
2	12SA7	0V	22.5VAC	94V. DC	94V. DC	-1V. DC	0V	11.5V.AC	-2V. DC
3	12SK7	0V	44.5VAC	0V	-2V. DC	0V	94V. DC	33.5VAC	94V. DC
4	12SQ7	0V	-4V. DC	0V	-1V. DC	-15 V. DC	51V. DC	11.5V. AC	0V
5	50L6GT	0V	87V. AC	84V. DC	94V. DC	-.75V.DC	0V	44.5VAC	0V
6	35Z5GT	0V	117V. AC	111V. AC	117V.AC	117V. AC	0V	87V. AC	118V. DC

RESISTANCE READINGS

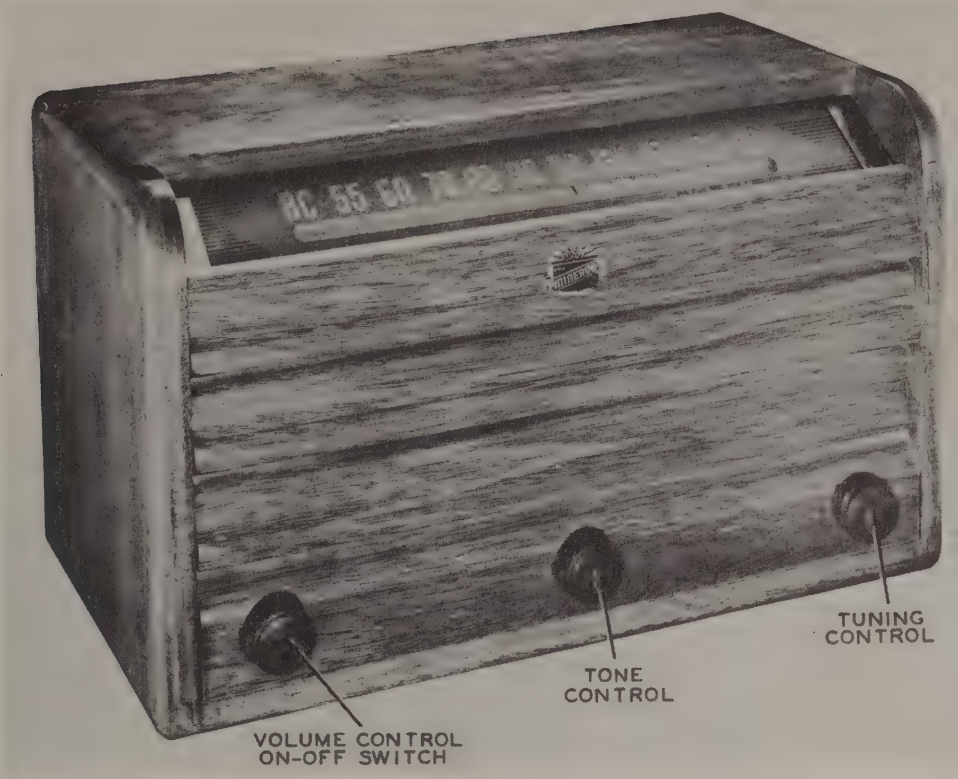
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	290Kn	135n	168n	2.7 MEG	168n	40Kn	124n	42Kn
2	12SA7	290 Kn	124n	40Kn	40Kn	25Kn	1.5n	112 n	2.7MEG
3	12SK7	290 Kn	148n	0n	2.4 MEG	0n	40Kn	135 n	40Kn
4	12SQ7	290 Kn	4.2 MEG	0n	590Kn	4.5 MEG	370Kn	112n	0n
5	50L6GT	I N F	192 n	40Kn	40Kn	530Kn	I N F	148n	0n
6	35Z5GT	I N F	215n	210n	36Kn	215n	98n	192n	36Kn

NOTE: VOLTAGE AND RESISTANCE READINGS TAKEN IN STANDARD BROADCAST POSITION.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MINERVA
MODELS W710, W710A (W119)



MINERVA
MODELS W710, W710A (W119)

MINERVA MODEL W710A

TRADE NAME	Minerva Models W710, W710A (W119)
MANUFACTURER	Minerva Corp. of America, 238 William St., New York, N.Y.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 12SK7 RF Amp., 12SA7GT Converter 12SK7 IF Amp., 12SQ7GT Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING .265 Amps. @ 117V AC
TUNING RANGE—BROADCAST	550-1600KC

ALIGNMENT INSTRUCTIONS

Check pointer setting as shown on dial plate diagram. Gang fully closed-pointer covers A, 600KC-pointer covers B, 1400KC-pointer covers C. Use isolation transformer if available. If not, connect capacitor in series with low side to chassis. Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to ant. stator section of tuning gang. Low side to chassis.	455KC	High freq. end of dial (gang open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200MMFD	High side to ant. lead. Low side to chassis.	"	"	"	A5	" " minimum "
"	"	1400KC	1400KC (Dial pointer over first hole from right end of dial plate.	"	A6,A7.	" " maximum

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MINERVA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SK7	12SK7	8N	
2	Converter	12SA7GT	12SA7GT	8AD	
3	IF Amp.	12SK7	12SK7	8N	
4	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MINERVA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	150		2N511	M-2x40-150	TA-440	PRS150-40-40	BRL44015	Filter - Red
B	40	150							" - Green
8	50	25		TC-29	M-50-25	TA-50	PRS25-50	BR502	35L6 Cath. Bypass
9	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
10	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	35L6 Plate Bypass
11	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	Tone Compensation
12	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
13	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	" "
14	.25	400		TP430	S-4-25	TC-2	484-.25	DT4P25	RF Bypass Pwr. Supp.
15	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
16	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Ant. Coupling
17	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	RF Bypass Vol. Cont.
18	300	500		MC241	MO.5-33	MS-33	1468-0003	5W5T3	RF Bypass Diode
19	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
20	300	500		MC241	MO.5-33	MS-33	1468-0003	5W5T3	RF Coupling
21	10								Fixed Trimmer*

*Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MINERVA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	500KΩ	1	50-11	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 22A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
23A	500KΩ	1	50-12	MR48	D13-133	M-60-Z	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 23A per instructions

RESISTORS

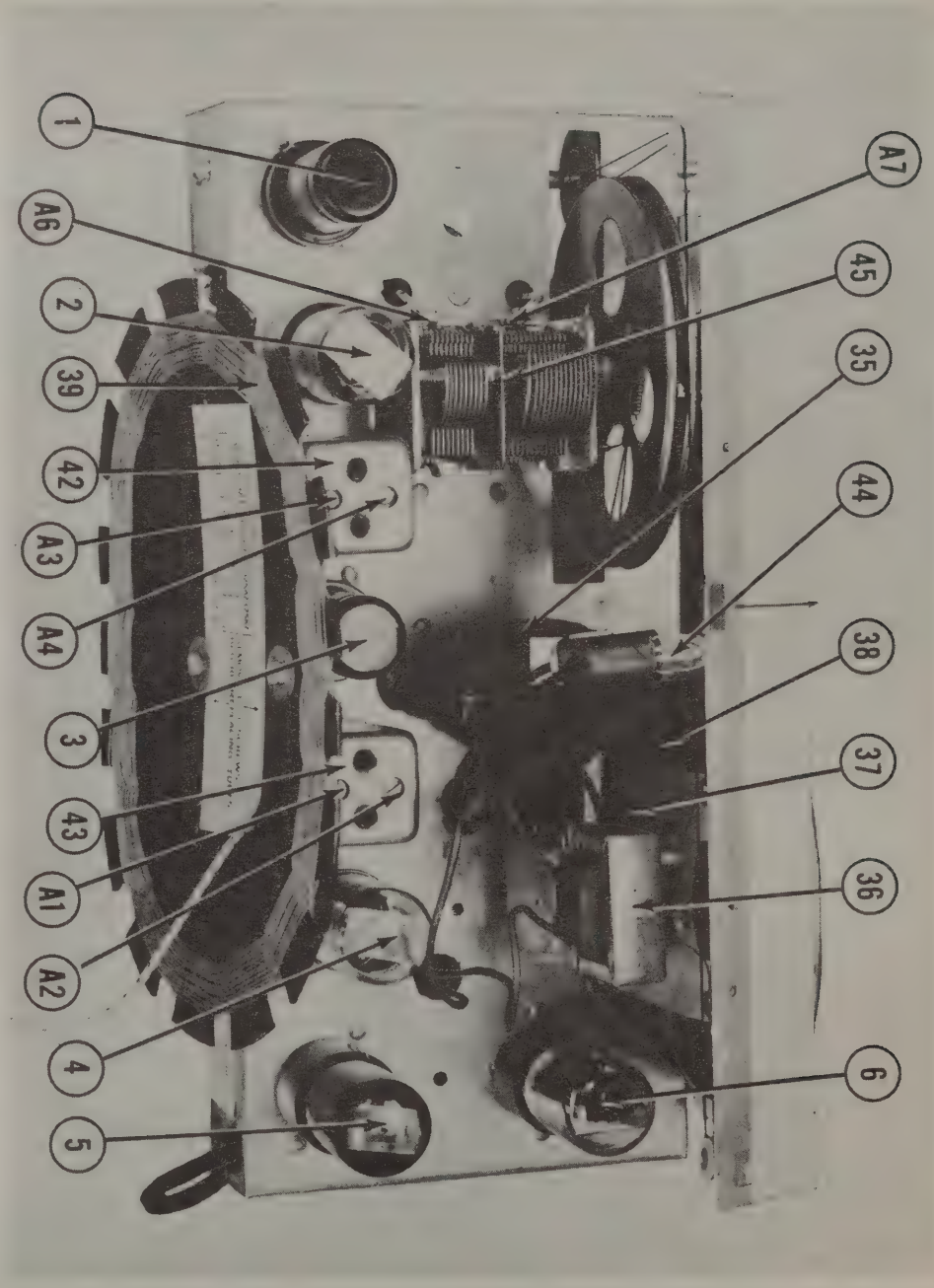
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MINERVA PART No.	IRC PART No.	IDENTIFICATION CODES
24	4700Ω	½		BTS-4700	Yl.-Vi.-Red RF Plate Load
25	47KΩ	½		BTS-47K	Yl.-Vi.-Or. Converter Grid
26	20KΩ	½		BTS-22K	Red-Blk.-Or. Osc. Grid
27	2.2 Meg.	½		BTS-2.2 Meg	Red-Red-Grn. AVC Network
28	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
29	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
30	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
31	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
32	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
33	100KΩ	½		BTS-100K	Br.-Blk.-Yl. IF Coil Shunt ‡
34	100KΩ	½		BTS-100K	Br.-Blk.-Yl. IF Coil Shunt ‡

‡May not be used in all models.

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000)	REPLACEMENT DATA: MINERVA PART NO.	STANCOR PART NO.	THORDARSON PART NO.	INSTALLATION NOTES
35	.081A	250Ω	10H		C-1709	T-13C29	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MINERVA PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
36	2,000Ω	2.8Ω	140Ω	1.0Ω	Part of 15-8	A-3876†	T-14S82†		†Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MINERVA PART No.	JENSEN PART No.		
	FIELD	VC IMP.				
37	PM	2.8Ω	15-8	ST-108		
	CONE DIA.	VC DIA.				
38	6-1/16"	9/16"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

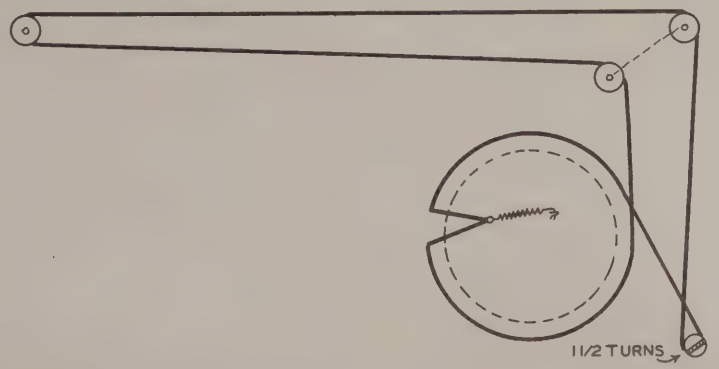
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	MINERVA PART No.	MEISSNER PART No.	
39	Loop Ant.	0Ω	1.2Ω	5-12		
40	Wave Trap	22Ω		5-13		
41	Osc. Coil		6Ω	5-11	14-1040	
42	Input IF	14.8Ω	10Ω	20-10	16-6662	
43	Output IF	12Ω	14Ω	20-11	16-6663	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MINERVA PART No.		
44	Bayonet	6-8	0.15	Brown			Type 47

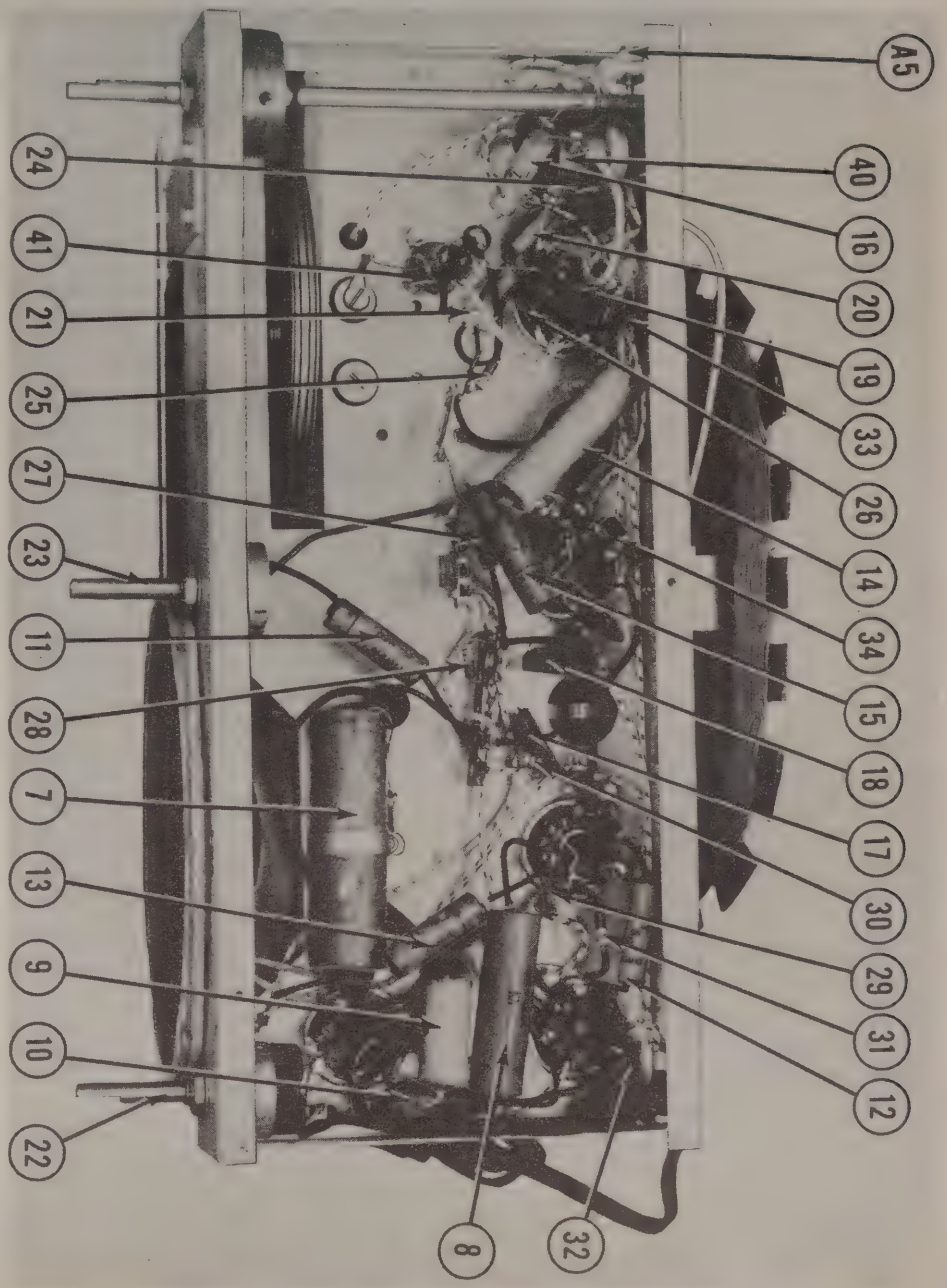
MISCELLANEOUS

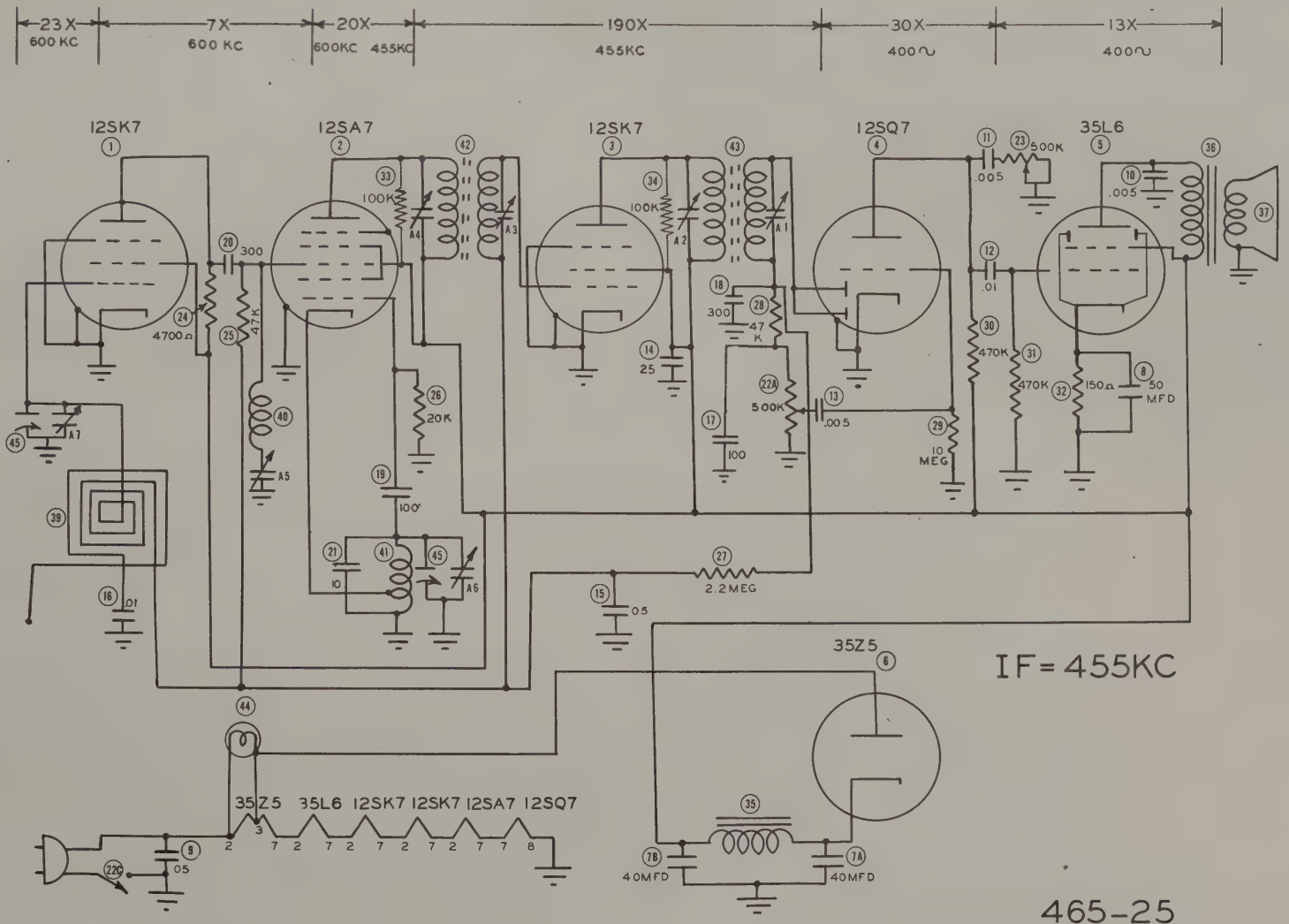
ITEM No.	PART NAME	MINERVA PART No.	NOTES
45	Tuning Cap.	25-10	2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	0V.	38V.AC	0V.	-.15V.DC	0V.	90V.DC	26V.AC	34V.DC
2	12SA7GT	0V.	26V.AC	90V.DC	90V.DC	-6.5V.DC	0V.	12.5VAC	-.15V.DC
3	12SK7	0V.	50V.AC	0V.	-.15V.DC	0V.	90V.DC	38V.AC	90V.DC
4	12SQ7GT	0V.	-.45V.DC	0V.	-.5V.DC	-.5V.DC	50V.DC	12.5V.AC	0V.
5	35L6GT	0V.	85V.AC	85V.DC	90V.DC	0V.	0V.	50V.AC	5.5V.DC
6	35Z5GT	0V.	117V.AC	112V.AC	0V.	112V.AC	0V.	85V.AC	110V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7	0Ω	38Ω	0Ω	2.5MEG	0Ω	53KΩ	25.5Ω	58KΩ
2	12SA7GT	0Ω	25.5Ω	53KΩ	53KΩ	18KΩ	.5Ω	12Ω	2.7MEG
3	12SK7	0Ω	50Ω	0Ω	2.5MEG	0Ω	53KΩ	38Ω	53KΩ
4	12SQ7GT	0Ω	10 MEG	0Ω	480KΩ	480KΩ	523KΩ	12Ω	0Ω
5	35L6GT	0Ω	87Ω	53KΩ	53KΩ	400KΩ	INF	50Ω	145Ω
6	35Z5GT	INF	112Ω	109Ω	INF	109Ω	INF	87Ω	53KΩ

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

UNITONE
MODEL 88

UNITONE
MODEL 88

UNITONE MODEL 88

TRADE NAME	Unitone Model 88
MANUFACTURER	Union Electronics Corp., 38-01 Queens Blvd., Long Island City, N.Y.
TYPE SET	AC-DC 2 Band Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 14A7/12B7 RF Amp., 14Q7 Converter, 14A7/12B7 IF Amp., 14B6 Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volts AC-DC — RATING - .270 Amps. @ 117V AC
TUNING RANGE—BROADCAST	530-1680KC — SHORT WAVE 5.5 - 18.3 MC

ALIGNMENT INSTRUCTIONS

Do not attempt alignment on metal bench. Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD.	High side to pin 6 of 14Q7. Low side to chassis.	455KC	BC	High freq. end of dial. (Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output
200 MMF	High side to ant lead. Low side to chassis.	1680KC	"	"	"	A5	" " " "
"	"	1400KC	"	Tune for maximum output.	"	A6	" " " "
"	"	600KC	"	"	"	A7	Rock dial and adjust for maximum output. Recheck A5 at 1680KC and A6 at 1400KC.
400 ohms	"	18.3MC	SW	High freq. end of dial. (Variable fully open.)	"	A8	Adjust for maximum output
"	"	15MC	"	Tune for maximum output.	"	A9	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: UNITONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	14A7/12B7	14A7/12B7	8V	
2	Converter	14Q7	14Q7	8AL	
3	IF Amp.	14A7/12B7	14A7/12B7	8V	
4	Det.-AVC-AF	14B6	14B6	8W	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: UNITONE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	150		2N511	M-2x40-150	TA-440	PRS150-40-40	BRD4415	Filter
B	40	150							"
8	25	25		TC26	M-25-25	TA-25	PRS25-25	BR252A	Cath. Bypass
9	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
10	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	35L6 Plate Bypass
11	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	Audio Coupling
12	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	" "
13	.007	800		TP445					Fixed Padder
14	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	Screen Bypass
15	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
16	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	Ant. Coupling
17	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Audio Plate Bypass
18	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.
19	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
20	50	500		MC225	M0.5-45	1FM-45	1468-00005	5W5C5	Osc. Grid Capacitor
21	300	500		MC241	M0.5-33	1FM-33	1468-0003	5W5T3	RF Coupling

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: UNITONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
22A	500KΩ	1	500M-6	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 22A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

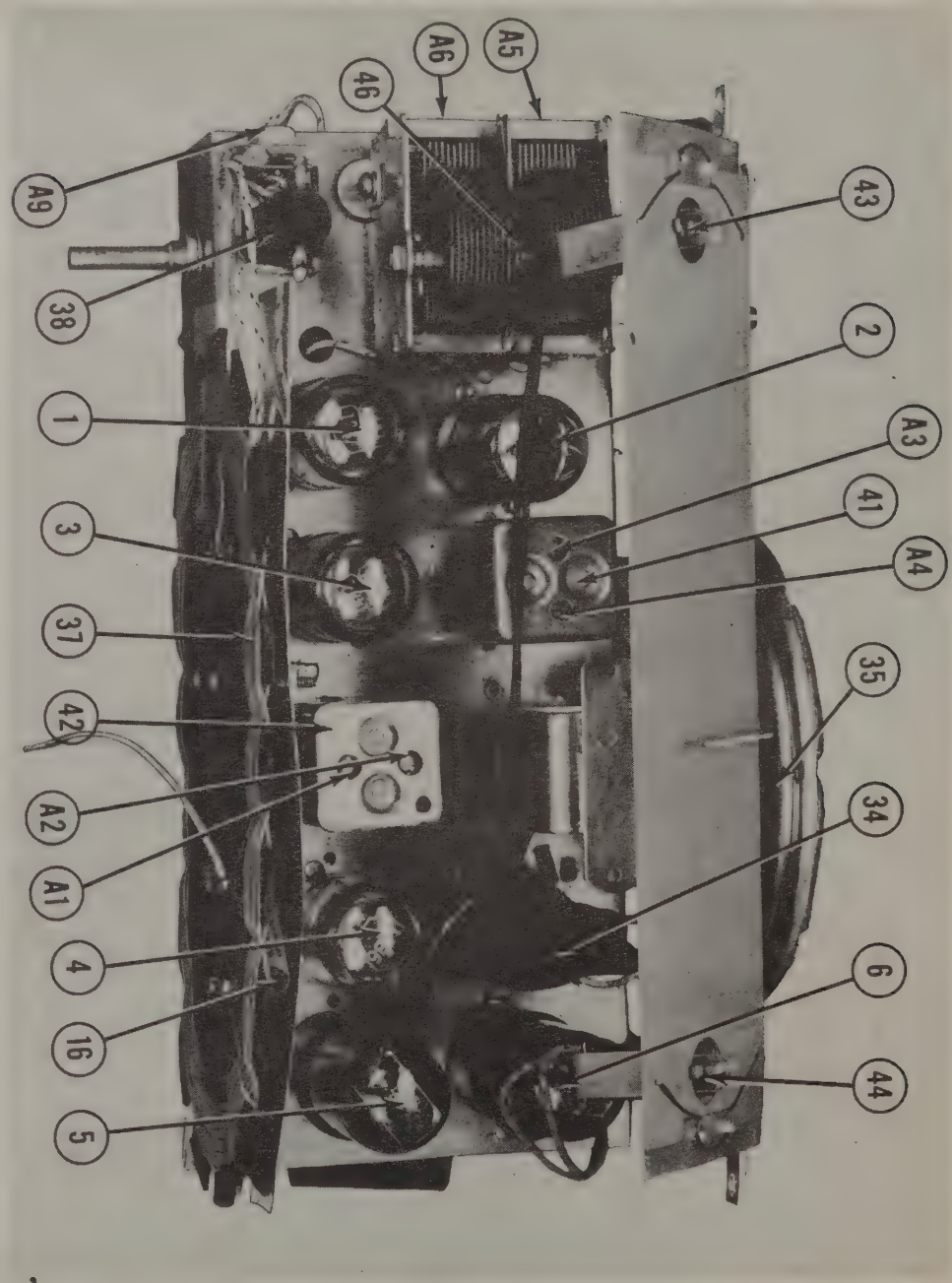
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: UNITONE PART No.	IRC PART No.	IDENTIFICATION CODES
23	3300Ω	½		BTS-3300	Or.-Or.-Red RF Plate Load
24	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Converter Grid
25	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
26	1 Meg.	½		BTS-1 Meg.	Br.-blk.-Grn. AVC Network
27	100KΩ	1		BTA-100K	Br.-blk.-Yl. IF Filter
28	330KΩ	½		BTS-330K	Or.-Or.-Yl. 1st AF Plate Load
29	3.9 Meg.	½		BTS-3.9 Meg.	Or.-White-Grn. 1st AF Grid
30	500KΩ	½		BTS-500K	Grn.-Blk.-Yl. Output Grid
31	150Ω	1		BW-1-150	Br.-Grn.-Br. Output Cathode
32	50Ω	1		BW-1-47	Grn.-Blk.-Blk. Pilot Light Shunt

FILTER CHOKE

ITEM NO.	RATINGS: TOTAL DIRECT CURRENT	RATINGS: D.C. RESISTANCE	RATINGS: INDUCTANCE (0 CURRENT 1000)	REPLACEMENT DATA: UNITONE PART NO.	STANCOR PART NO.	THORDARSON PART NO.	INSTALLATION NOTES
33	79MA.	100	1.7 Henries			T57C51*	*Drill one new mounting hole

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		UNITONE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
34	18000Ω	3.5Ω	84Ω	.7Ω		A-3876	T-22545		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			UNITONE PART No.	JENSEN PART No.		
35	FIELD PM	VC IMP. 3.5Ω		ST-107 Mod. P5-V		
36	CONE DIA. 4-3/4"	VC DIA. 9/16"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

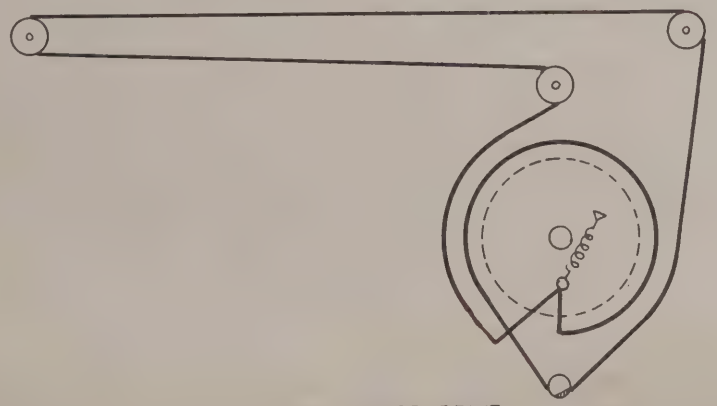
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	UNITONE PART No.	MEISSNER PART No.	
37	Loop Ant.	0Ω	0Ω			
38	SW Ant.Coil	0Ω	0Ω		14-1044	
39	BC Osc. "		5.3Ω		14-1040	
40	SW " "		.3Ω		14-1046	
41	Input IF	16Ω	16Ω		16-6658	
42	Output IF	14Ω	14Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					UNITONE PART No.		
43	Bayonet	6-8	0.15	Brown			Type 47
44	"	6-8	0.15	"			" "

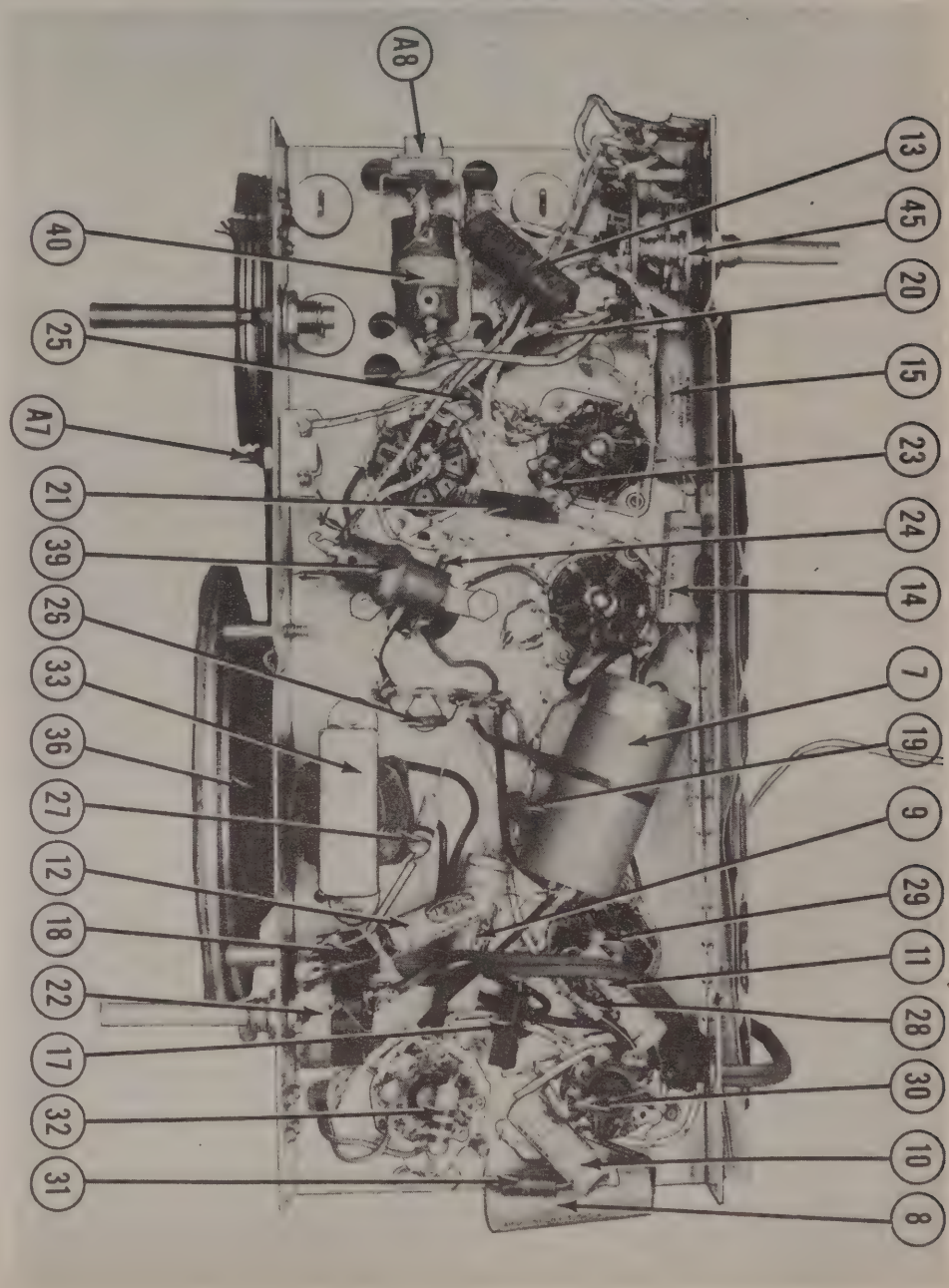
MISCELLANEOUS

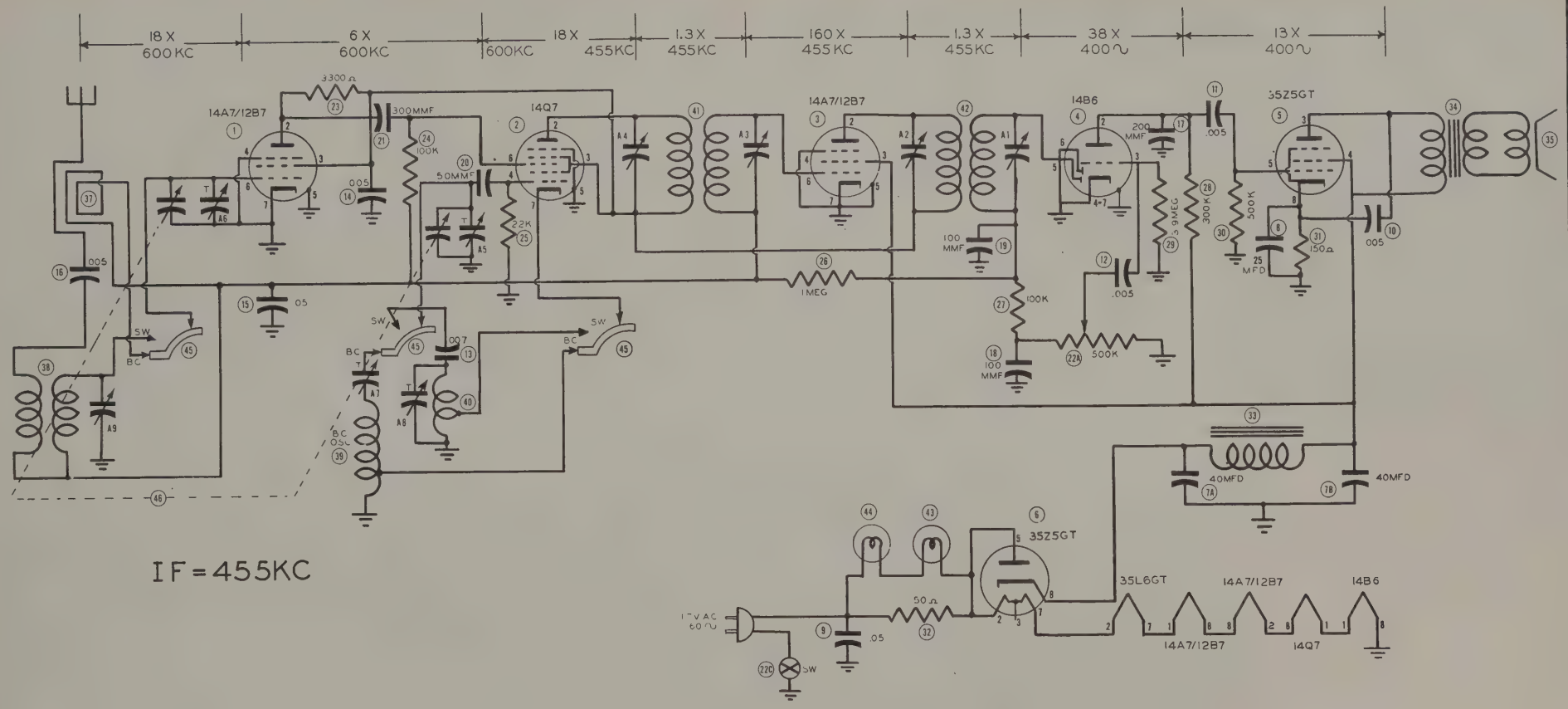
ITEM No.	PART NAME	UNITONE PART No.	NOTES
45	Switch		2 Position Band
46	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





NOTE: VOLTAGE AND RESISTANCE READINGS TAKEN IN STANDARD BROADCAST POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14A7/12B7	24V. AC	69V.DC	98V.DC	0V	0V	-.25V.DC	0V	34.8VAC
2	14Q7	12.5VAC	98V.DC	98V.DC	-1.3V.DC	0V	-15V. DC	0V	24V. AC
3	14A7/12B7	45.5VAC	98V.DC	98V.DC	0V	0V	-2.5V.DC	0V	34.8VAC
4	14B6	12.5VAC	56V.DC	-.55V.DC	0V	-57V.DC	0V	0V	0V
5	35L6GT	0V	80V.AC	94V.DC	98V.DC	0V	0V	45.5VAC	5.6V. DC
6	35Z5GT	117V. AC	110V. AC	103V.AC	0V	110V. AC	113V. AC	80V.AC	107V. DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14A7/12B7	24Ω	75KΩ	72KΩ	0Ω	0Ω	1.3 MEG	0Ω	35Ω
2	14Q7	11.5Ω	72KΩ	72KΩ	18KΩ	0Ω	1.4 MEG	.4Ω	24Ω
3	14A7/12B7	46Ω	72KΩ	72KΩ	0Ω	0Ω	1.3 MEG	0Ω	35Ω
4	14B6	11.5Ω	402KΩ	3.4 MEG	0Ω	500KΩ	0Ω	0Ω	0Ω
5	35L6GT	0Ω	79Ω	72KΩ	72KΩ	470KΩ	INF	46Ω	130Ω
6	35Z5GT	115Ω	110Ω	102Ω	INF	110Ω	113Ω	79Ω	72KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-26

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

ANSLEY
MODEL 32

ANSLEY
MODEL 32

ANSLEY MODEL 32

TRADE NAME	Ansley Model 32 for use with the cabinet styles "Allegro", "Largo", "Oxford" and "Rondo".		
MANUFACTURER	Ansley Radio Corp., 41 St. Joes Ave., Trenton, N.J.		
TYPE SET	2 Band Superheterodyne - Self Contained Loop Antenna		
TUBES (NINE)	Type, 12SK7GT RF Amp., 12SA7 Converter, 6SK7GT IF Amp., 6SQ7GT Det.-AVC-AF, 6J5 Phase Inverter, 2-50L6GT Power Output, 2-25Z5GT Rectifier.		
POWER SUPPLY	115 Volts AC	RATING	.750 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1630KC	**SHORT WAVE**	5.7 - 18.3MC

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting. Use isolation transformer if available. If not, connect isolating capacitor in series with low lead to B- for IF alignment.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to RF stator section of tuning gang. Low side to B-.	456KC	BC	High freq. end of dial.	Across voice coil	A1,A2, A3,A4	Adjust for maximum output
200MMFD	High side to ext. ant. lead. Low side to ext.grd. lead.	1600KC	"	1600KC	"	A5	" " " "
"	"	1400KC	"	Tune in 1400 KC signal.	"	A6	" " " "
"	"	600KC	"	Tune in 600 KC signal.	"	A7	Rock dial and adjust for maximum output. Repeat adjustments A5,A6, and A7 for maximum output
400Ω res.	"	16MC	SW	16MC	"	A8	Adjust for maximum output
"	"	"	"	"	"	A9,A10	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: ANSLEY PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	12SK7GT	12SK7GT	8N	
2	Converter	12SA7	12SA7	8R	
3	IF Amp.	6SK7GT	6SK7GT	8N	
4	Det.-AVC-AF	6SQ7GT	6SQ7GT	8Q	
5	Phase Inverter	6J5GT	6J5GT	6Q	
6	Power Output	50L6GT	50L6GT	7AC	
7	Power Output	50L6GT	50L6GT	7AC	
8	Rectifier	25Z5	25Z5	6E	
9	Rectifier	25Z5	25Z5	6E	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ANSLEY PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
10A	40	150		FP3571††	DY-80+40+20-150	EL-452	AF886D4A	UP6CJ141	■ Filter
B	80	150							● "
C	25	25		TC26				BR252A	▲ Cath. Bypass
11	40	150		FP115	DY-40-150	EL-14	AF8D	UP4AJ25	Filter
12	25	25		TC26	M-25-25	TA-25	PRS25-25	BR252A	Cath. Bypass
13	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
14	.006	600		TP409	S-6-006	TC-26	684-006	DT6D6	50L6 Plate Bypass
15	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Tone Compensation
16	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Audio Coupling
17	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Audio Coupling
18	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
19A	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	RF Bypass Pwr. Supp.
B	.1	600		TP418	S-6-1	TC-1	684-.1	DT6P1	" " " " *
20	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Phono Coupling
21	.006	600		TP409	S-6-006	TC-26	684-006	DT6D6	Phono Coupling
22	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	IF Cath. Bypass
23	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Conv. Plate Bypass
24	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	RF Coupling Gang Cap.
25	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	RF Screen Bypass
26	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	RF Cath. Bypass
27	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Isolating
28	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	RF Coupling Gang Cap.
29	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
30	.02	400		TP423	S-4-02	TC-12	464-02	DT4S2	Ant. Coupling
31	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter †
32	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Diode Coupling
33	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
34	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
35	50	500		MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Tone Compensation
36	50	500		MC225	MO.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor
37	3000	500		MC461	MW.5-23	1FM-23	1464-003	1W5D3	Fixed Padder

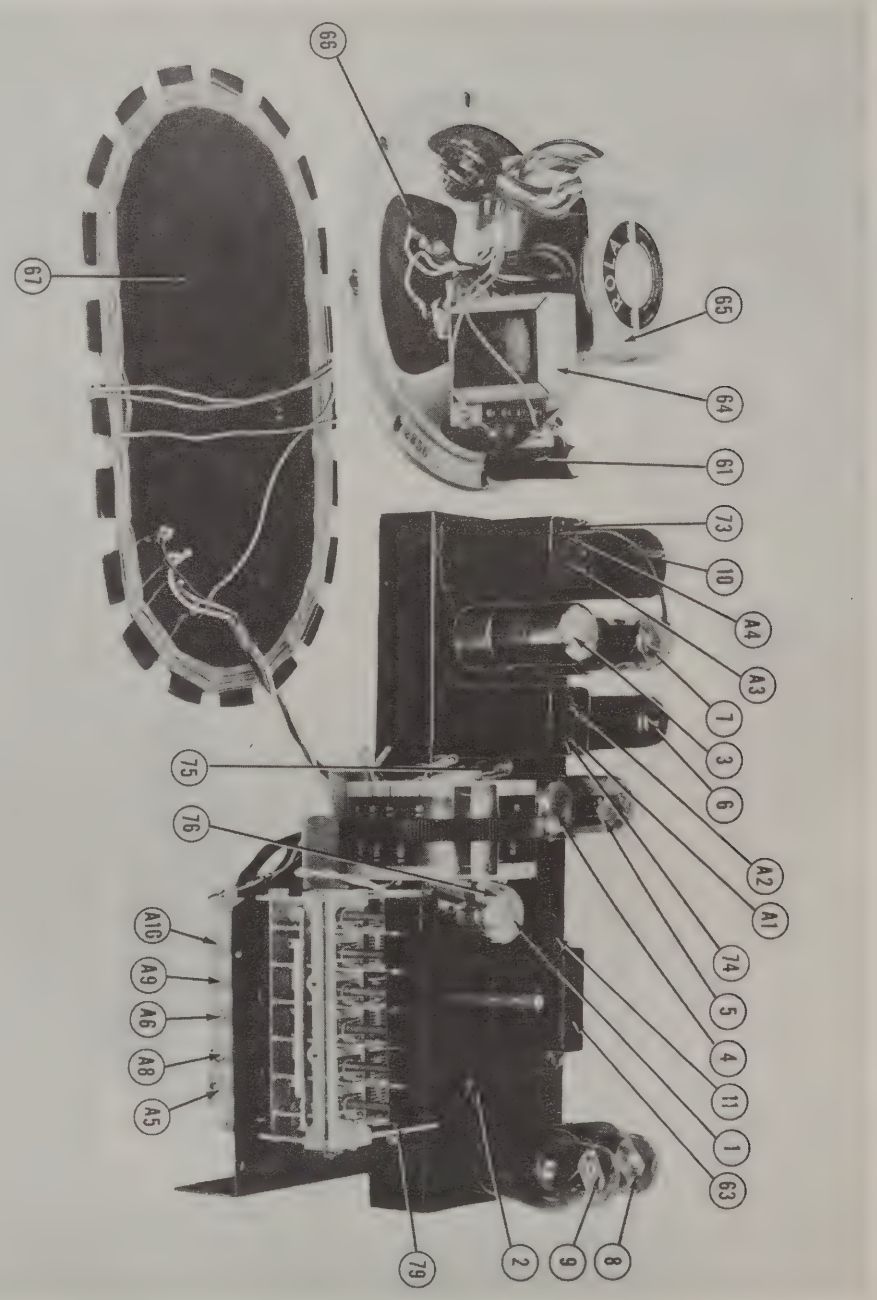
*Used in some models
†Not used in all models
††Parallel two 40 MFD sections.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ANSLEY PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
38A	500KΩ	1	GC-45	MR48	D13-133	M-60-Z	Volume Control-See Note 1
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 38A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
38A	1 Meg.	1	RP-4	MR53	D13-137	M-63-Z	Volume Control - See Note 2
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 38A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
39A	500KΩ	1		MR48	D13-133	M-60-Z	Tone Control
B	Shaft			Not Req.	A	Not Req.	Attach to 39A per instructions

Note 1 -Used in later production
Note 2 -Used in early production

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	ANSLEY PART No.	IRC PART No.	
40	240KΩ	½		BTS-220K	Red-Yl.-Yl. AVC Network
41	330Ω	1		BTA-330	Or.-Or.-Br. RF Cathode
42	3300Ω	½		BTS-3300	Or.-Or.-Red RF Coil Shunt
43	20KΩ	½		BTS-22K	Red-Blk.-Or. Osc. Grid
44	51Ω	½		BW-½-47	Grn.-Br.-Blk. Osc. Tuned Circuit
45	1000Ω	½		BTS-1000	Br.-Blk.-Red Conv. Plate Filter
46	330Ω	1		BTA-330	Or.-Or.-Br. IF Cathode
47	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Diode Load
48	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
49	50KΩ	½		BTS-47K	Grn.-Blk.-Or. IF Filter
50	240KΩ	½		BTS-220K	Red-Yl.-Yl. Diode Load
51	100KΩ	½		BTS-100K	Br.-Blk.-Yl. 1st AF Plate Load
52	5100Ω	½		BTS-4700	Grn.-Blk.-Red Inverter Cathode
53	10KΩ	½		BTS-10K	Br.-Blk.-Or. 1st AF Cathode
54	12Ω	½		BW-½-12	Br.-Red-Blk. Feedback
55	240Ω	1		BTA-220	Red-Yl.-Br. Feedback
56	100KΩ	½		BTS-100K	Br.-Blk.-Yl. Inverter Plate Load
57	200KΩ	½		BTS-220K	Red-Blk.-Yl. Output Grid
58	20KΩ	½		BTS-22K	Red-Blk.-Or. Phase Inverter Voltage Divider
59	200KΩ	½		BTS-220K	Red-Blk.-Yl. Output Grid
60	75Ω	10		AB-75	Output Cathode
61	150Ω	25		DG-150	Line Dropping
62	8Ω	10		AB-7.5	Pilot Light Shunt

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA			INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000~)	ANSLEY PART NO.	STANCOR PART NO.	THORDARSON PART NO.	
63	45MA	370Ω	13 Henries		C-1227	T-14C64	

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		ANSLEY PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
64	12000Ω	4.1Ω	395Ω	.5Ω		A-3831	T-13S40		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			ANSLEY PART No.	JENSEN PART No.		
65	FIELD RES. 1500Ω	VC IMP. 4.1Ω				
66	CONE DIA. 7½"	VC DIA. 1"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

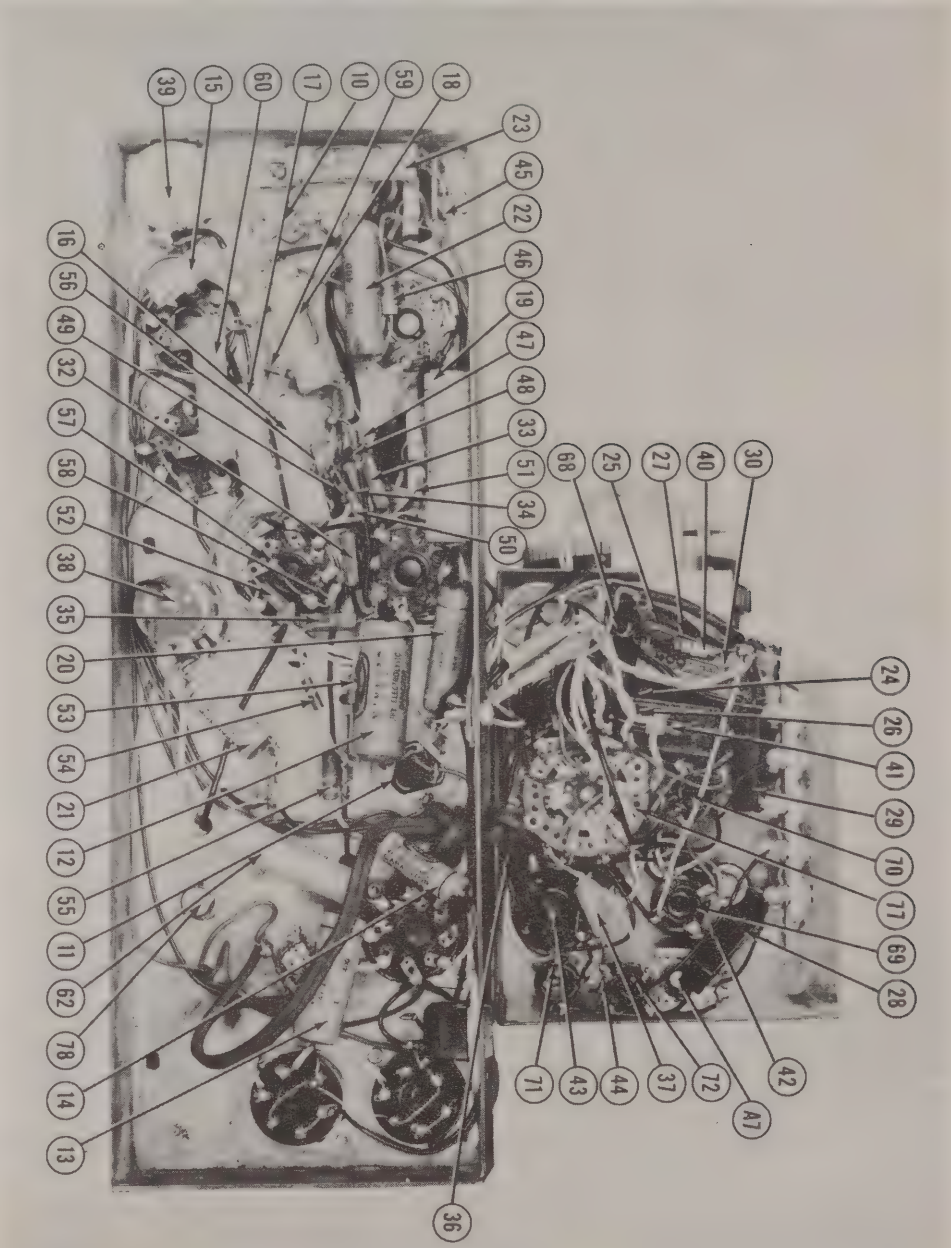
R F COILS

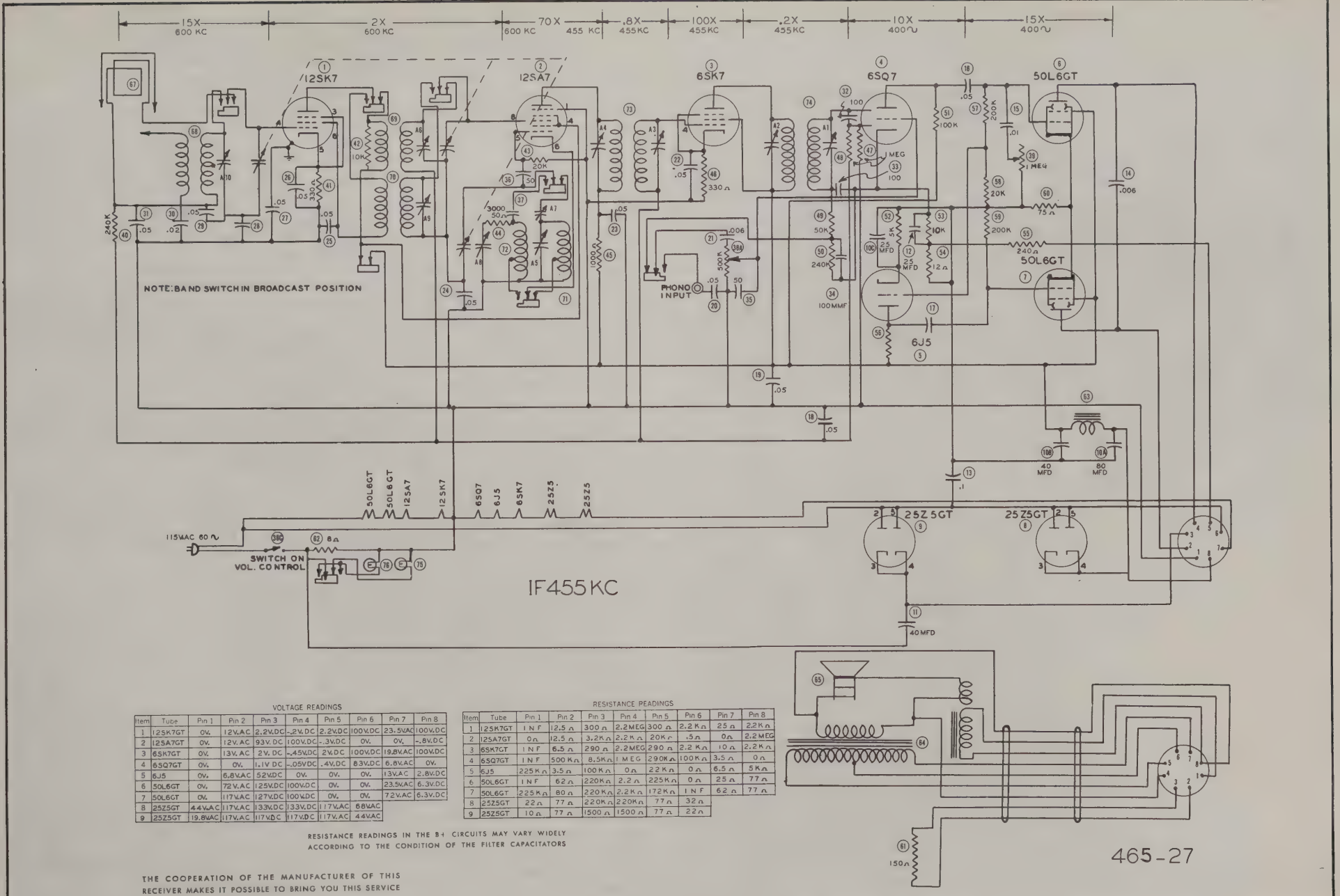
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	ANSLEY PART No.	MEISSNER PART No.	
67	Loop Ant.	.1Ω	1.5Ω			
68	SW Ant.Coil	.3Ω	.3Ω			
69	BC RF "	64Ω	8Ω			
70	SW " "	4.5Ω	.3Ω			
71	BC Osc. "		5Ω			
72	SW " "		.5Ω			
73	Input IF	15.5Ω	15.5Ω		16-6658	
74	Output IF	15.5Ω	15.5Ω		16-6630	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					ANSLEY PART No.		
75	Bayonet	6-8	0.15	Brown			Type 47
76	"	6-8	0.15	"			" "

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	0V.	12V.AC	2.2V.DC	-.2V.DC	2.2VDC	100V.DC	23.5VAC	100V.DC
2	12SA7GT	0V.	12V. AC	93V. DC	100V.DC	-.3V.DC	0V.	0V.	-.8V.DC
3	6SK7GT	0V.	13V. AC	2V. DC	-.45V.DC	2V.DC	100V.DC	19.8VAC	100V.DC
4	6SQ7GT	0V.	0V.	1.1V DC	-.05VDC	.4V.DC	83V.DC	6.8VAC	0V.
5	6J5	0V.	6.8VAC	52VDC	0V.	0V.	0V.	13V.AC	2.8V.DC
6	50L6GT	0V.	72V.AC	125V.DC	100V.DC	0V.	0V.	23.5VAC	6.3V.DC
7	50L6GT	0V.	117V.AC	127V.DC	100V.DC	0V.	0V.	7.2V.AC	6.3V.DC
8	25Z5GT	44V.AC	117V.AC	133V.DC	133V.DC	117V.AC	68VAC		
9	25Z5GT	19.8VAC	117V.AC	117V.DC	117V.DC	117V.AC	44VAC		

RESISTANCE READINGS

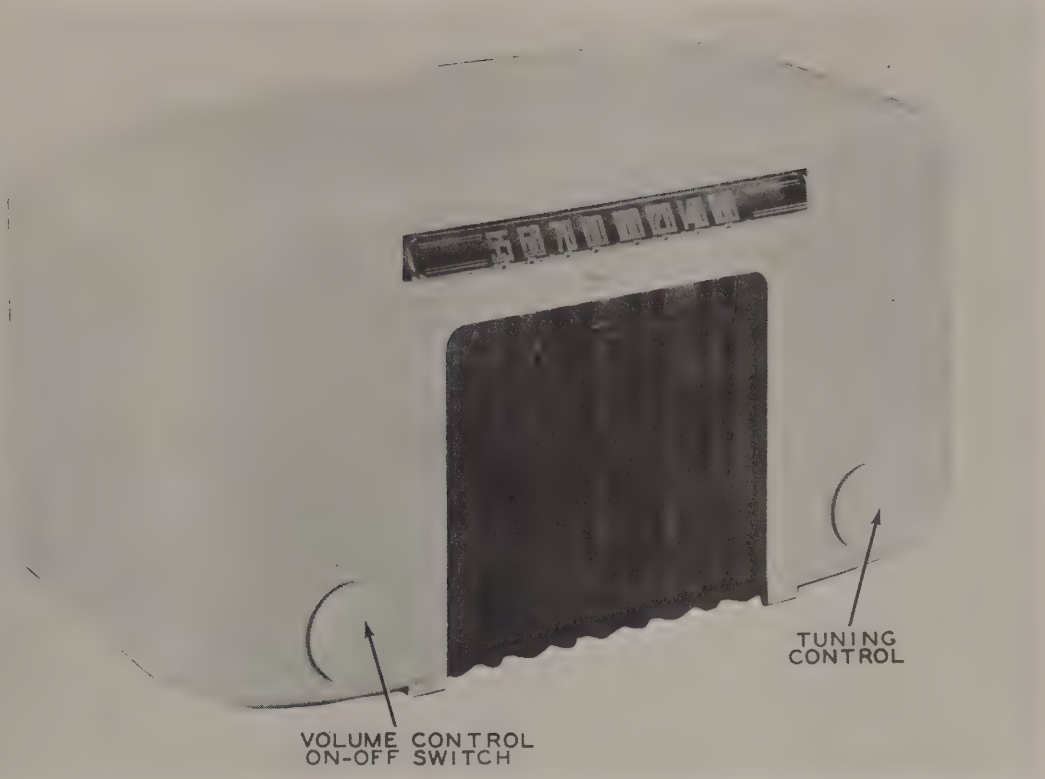
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	INF	12.5 Ω	300 Ω	2.2MEG	300 Ω	2.2 KΩ	25 Ω	2.2 KΩ
2	12SA7GT	0Ω	12.5 Ω	3.2KΩ	2.2 KΩ	20KΩ	.5Ω	0Ω	2.2MEG
3	6SK7GT	INF	6.5 Ω	290 Ω	2.2MEG	290 Ω	2.2 KΩ	10 Ω	2.2 KΩ
4	6SQ7GT	INF	500 KΩ	8.5KΩ	1 MEG	290KΩ	100KΩ	3.5 Ω	0Ω
5	6J5	225KΩ	3.5 Ω	100KΩ	0Ω	22KΩ	0Ω	6.5 Ω	5KΩ
6	50L6GT	INF	62 Ω	220KΩ	2.2 Ω	225KΩ	0Ω	25 Ω	77 Ω
7	50L6GT	225KΩ	80 Ω	220KΩ	2.2KΩ	172KΩ	INF	62 Ω	77 Ω
8	25Z5GT	22 Ω	77 Ω	220KΩ	220KΩ	77 Ω	32 Ω		
9	25Z5GT	10 Ω	77 Ω	1500 Ω	1500 Ω	77 Ω	22 Ω		

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



GAROD
MODEL 5A2

GAROD
MODEL 5A2

GAROD MODEL 5A2

TRADE NAME	Garod Model 5A2
MANUFACTURER	Garod Radio Corp., 70 Washington St., Brooklyn, N.Y.
TYPE SET	AC - DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7GT IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING .250 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1	High side to stator lug on rear section of variable. Low side to chassis.	455KC	High freq. end of dial. (Variable fully clockwise)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
100 MMF	High side to ant lead. Low side to chassis.	1650KC	"	"	A5	" " " "
"	"	1500KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		GAROD PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	GAROD PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
6A	40	150	5.400-8	┌2N511	┌M-2x40-150	┌TA-440	┌PRSA150-40-40	┌BRD4415	Filter - Red
B	40	150							" - Blue
C	20	150		└TC45	└M-20-150	UT-201	PRS150-20	BR2015	" - Green
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass
9	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	" "
11	.2	400		TP429	S-4-2	TC-2	484-.2	DT4P2	IF Cath. Bypass
12	.02	200		TP423	S-4-02	TC-12	484-02	DT4S2	AVC Filter
13	.006	600		TP409	S-6-006	TC-26	684-006	DT6D6	Ant. Coupling
14	250	500		MC240	MO.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
15	250	500		MC240	MO.5-325	1FM-325	1468-00025	5W5T25	IF Bypass Diode

CONTROLS

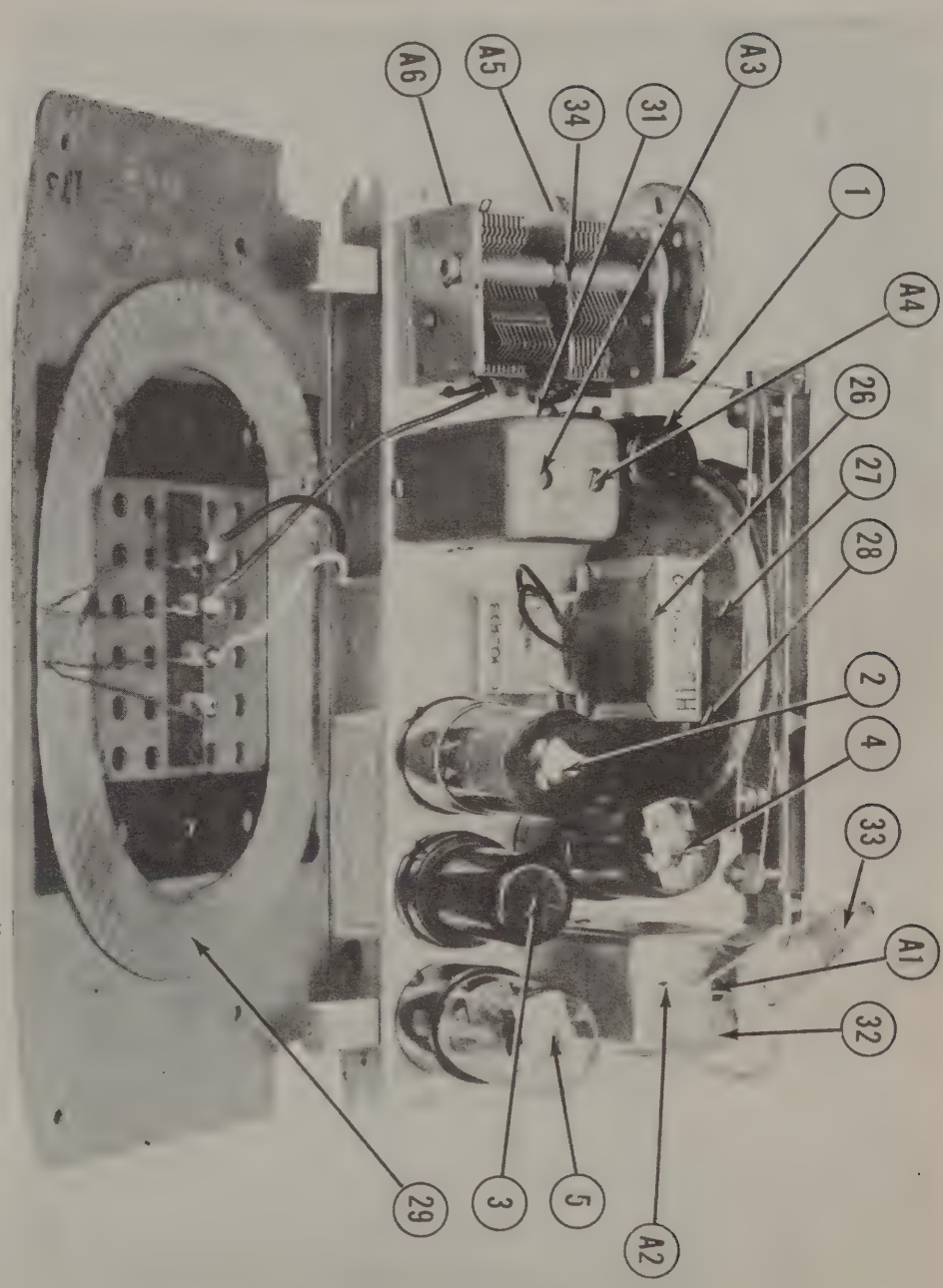
ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	GAROD PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	1 Meg.	1	8.201-1	MK402	D13-137	AM-63-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
16A	1 Meg.	1	8.200-1	MK402*	D13-137*	AM-63-Z*	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

*Install a 50KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft side, terminals down.)

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	GAROD PART No.	IRC PART No.	
17	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
18	150Ω	½		BW-½-150	Br.-Grn.-Br. IF Cathode
19	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
20	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. 1st AF Grid
21	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
22	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
23	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
24	100Ω	1		BW-1-100	Br.-Blk.-Br. Filter
25	1000Ω	1		BTA-1000	Br.-Blk.-Red "

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		GAROD PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
26	17002	32	1362	.452		A-3876†	T-22S45		†Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

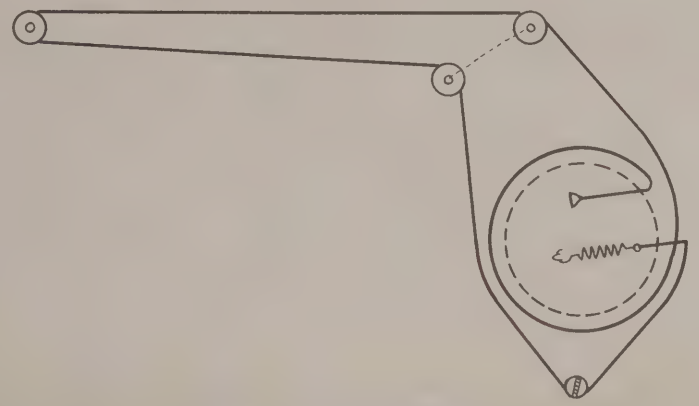
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			GAROD PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-113		
27	PM	32		Model P4-X		
	CONE DIA.	VC DIA.				
28	4"	½"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	GAROD PART No.	MEISSNER PART No.	
29	Loop Ant.	.2Ω	3.5Ω	1.403		
30	Osc. Coil	0Ω	6.8Ω	1.402	14-1040	Add 50 MMFD cap. from grid to high side tuning cap.
31	Input IF	45Ω	43Ω	1.259	16-6658	
32	Output IF	42Ω	44Ω	1.409	16-6660	

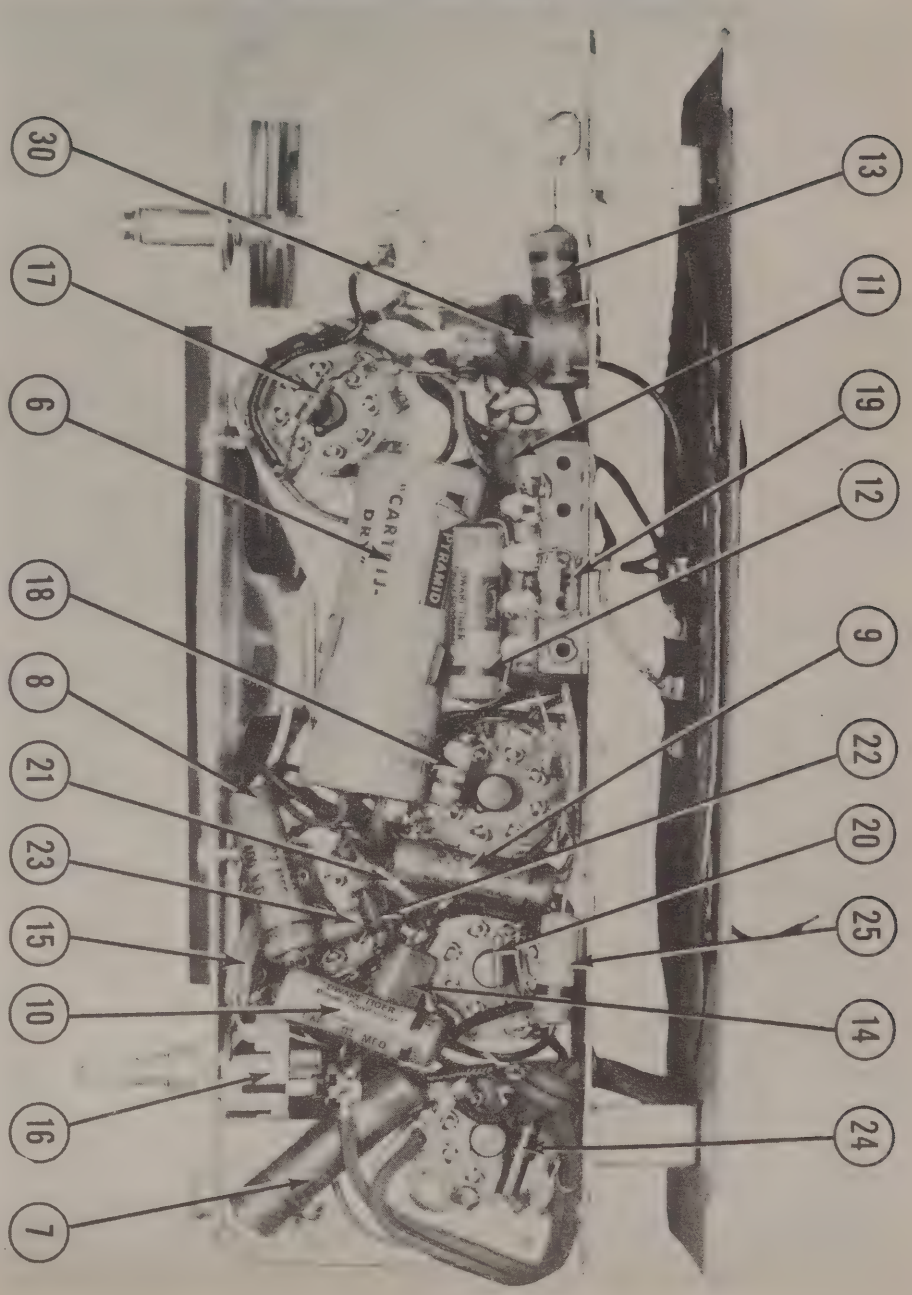
DIAL LIGHT

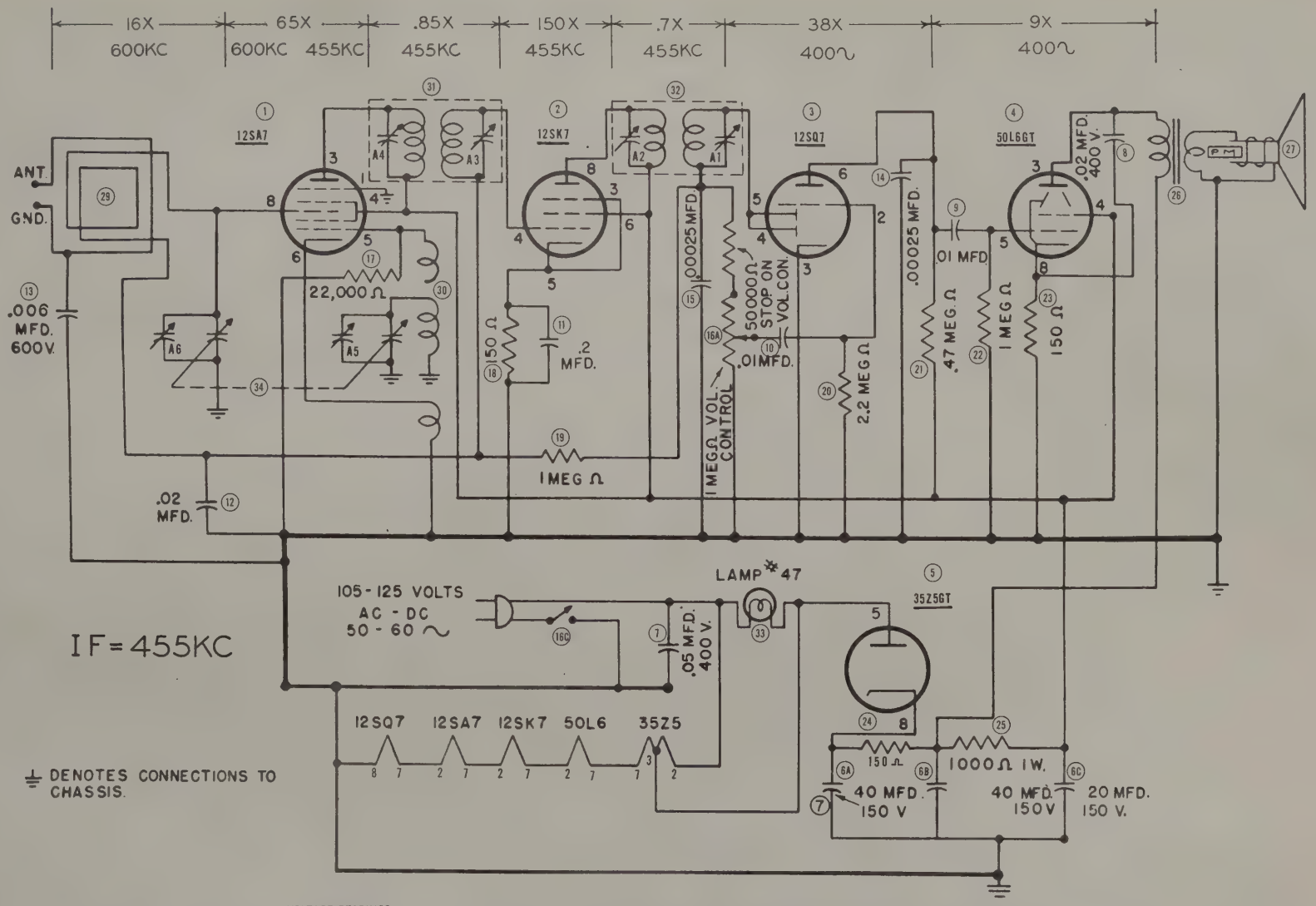
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					GAROD PART No.		
33	Bayonet	6-8	0.15	Brown			Type 47



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V.	12.5V.AC	87V.DC	87V.DC	-5.8V.DC	0V.	25.5V.AC	0V.
2	12SK7GT	0V.	25.5V.AC	1.6V.DC	0V.	1.6V.DC	87V.DC	36.5V.AC	87V.DC
3	12SQ7	0V.	-.35V.DC	0V.	-.25V.DC	-.25V.DC	39V.DC	12.5V.AC	0V.
4	50L6GT	0V.	87V.AC	107V.DC	87V.DC	0V.	0V.	36.5V.AC	5.8V.DC
5	35Z5GT	0V.	117V.AC	113V.AC	113V.DC	113V.AC	0V.	87V.AC	119V.DC

RESISTANCE READINGS

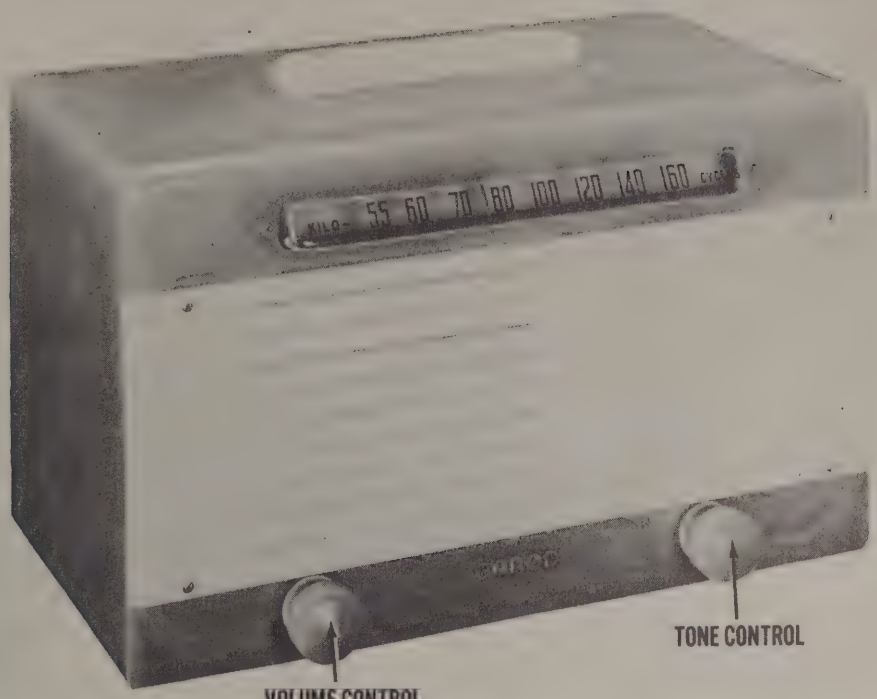
Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0 Ω	11.5 Ω	1.8MEG	1.8MEG	24.5KΩ	.5 Ω	23 Ω	1.7MEG
2	12SK7GT	0 Ω	23 Ω	140 Ω	1.7MEG	140 Ω	1.8MEG	36 Ω	1.8MEG
3	12SQ7	0 Ω	2.2MEG	0 Ω	420KΩ	420KΩ	2.3MEG	11.5 Ω	0 Ω
4	50L6GT	INF	82 Ω	1.8MEG	1.8MEG	950KΩ	0 Ω	36 Ω	140 Ω
5	35Z5GT	INF	110 Ω	108 Ω	1.8MEG	108 Ω	0 Ω	82 Ω	1.8MEG

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-28

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**



GAROD
MODEL 6AU-1

GAROD
MODEL 6AU-1

GAROD MODEL 6AU-1

TRADE NAME	Garod Model 6AU-1 "The Commander"
MANUFACTURER	Garod Radio Corp., 70 Washington St., Brooklyn, N.Y.
TYPE SET	AC - DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 6SS7 RF Amp., 12SA7 Converter, 6SS7 IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier
POWER SUPPLY	105-125 Volts AC-DC RATING .250 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1650KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1MFD.	High side to stator lug on rear section of variable capacitor. Low side to B-.	455KC	Variable fully clockwise.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
100 MMF	High side to ant. lead. Low side to B-.	1650KC	"	"	A5	" " " "
"	"	1500KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: GAROD PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	6SS7	6SS7	8N	
2	Converter	12SA7	12SA7	8R	
3	IF Amp.	6SS7	6SS7	8N	
4	Det.-AVC-AF	12SQ7	12SQ7	8Q	
5	Power Output	50L6GT	50L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: GAROD PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	20	150	5.400-7	TC45	1-20-150	UT-201	PRS150-20	BR2015	Filter
B	80	150		FP357†	DY-3x40-150†	EL-340†	AF888D†	UP6CJ44†	■ Filter
C	40	150							▲ "
8	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
9	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.01	200		TP421	S-4-01	TC-11	484-01	DT4S1	" "
12	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	IF Cath. Bypass
13	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	AVC Filter
14	.2	400		TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating
15	.02	200		TP423	S-4-02	TC-12	484-02	DT4S2	AVC Filter
16	.005	600		TP408	S-6-005	TC-25	684-005	D16D5	Ant. Coupling
17	250	500		MC240	MO.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
18	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	Tone Compensation
19	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
20	100	500		MC235	MO.5-31	1FM-31	1468-0001	5W5T1	RF Coupling

†Parallel two sections.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GAROD PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21A	1 Meg.	1	111-C-1	MK402	D13-137	AM-63-Z	Volume Control - See Note 1
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 21(A) per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
21A	1 Meg.	1	5.200	MK402*	D13-137*	AM-63-Z*	Volume Control. See Note 1
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 21(A) per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

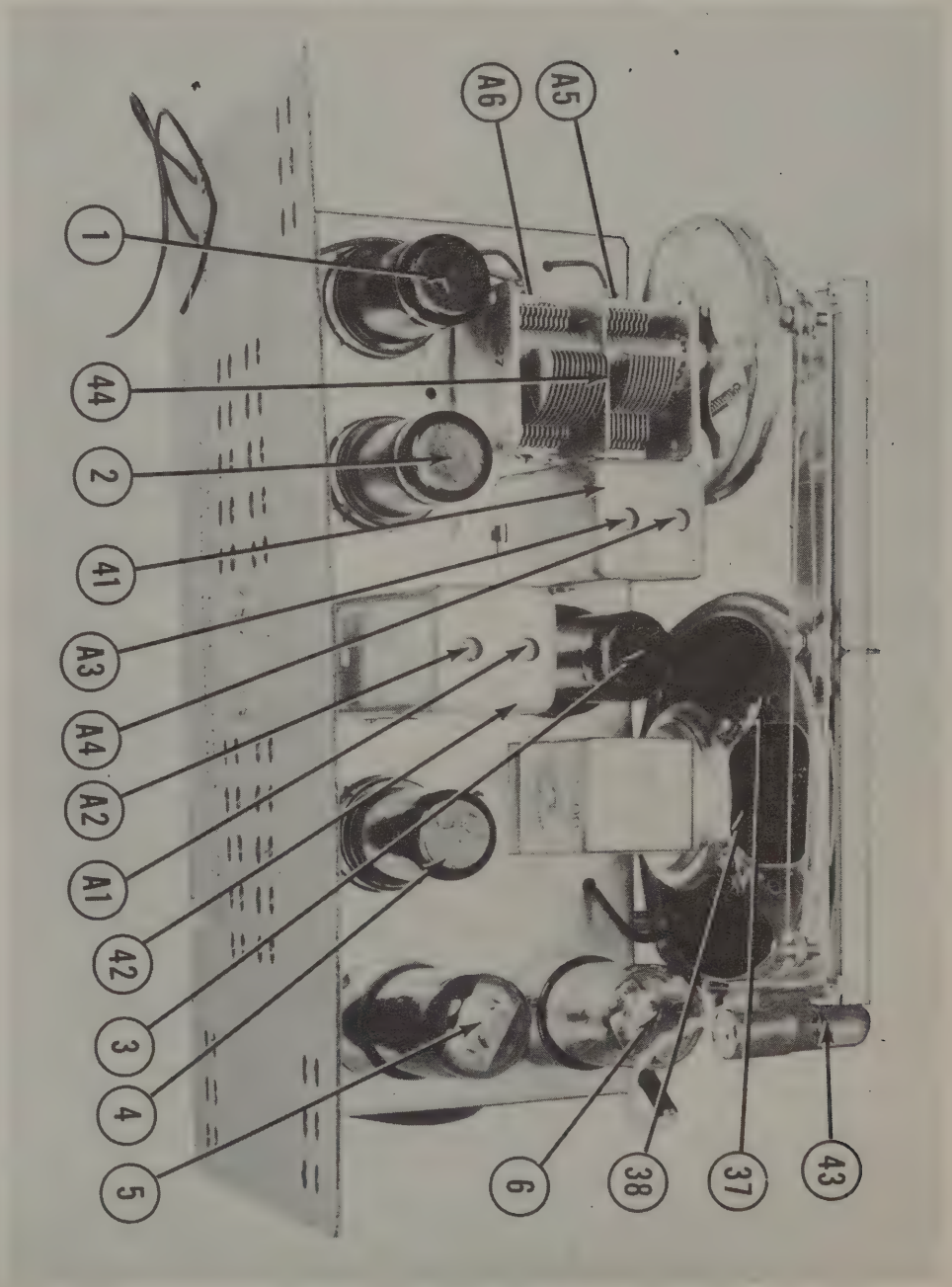
*Install a 50KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft side, terminals down.)

Note 1 - File out split in knurled shaft.

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: GAROD PART No.	IRC PART No.	IDENTIFICATION CODES
22	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
23	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. " "
24	2200Ω	½		BTS-2200	Red-Red-Red RF Plate Load
25	220KΩ	½		BTS-220K	Red-Red-Yl. Line Isolating
26	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Converter Grid
27	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
28	270Ω	½		BW-½-270	Red-Vi.-Br. IF Cathode
29	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. 1st AF Grid
30	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
31	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
32	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
33	1000Ω	1		BTA-1000	Br.-Blk.-Red Filter
34	100Ω	½		BW-½-100	Br.-Blk.-Br. "
35	270Ω	½		BW-½-270	Red-Vi.-Br. Pilot Light Shunt

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		GAROD PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
36	1650Ω	3.1Ω	150Ω	.45Ω	9.200	A-3876	T-22S45		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			GAROD PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-107‡		
37	PM	3.1Ω	30.300	Mod. P5-V		‡Fabricate new mounting bracket.
	CONE DIA.	VC DIA.				
38	4-1/2"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT			

R F COILS

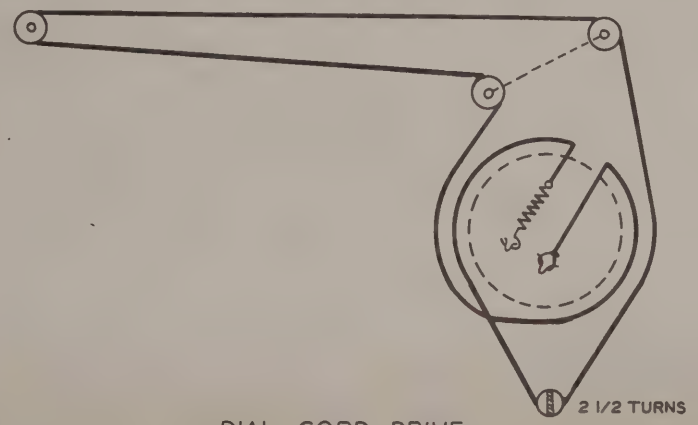
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	GAROD PART No.	MEISSNER PART No.	
39	Loop Ant.	.3Ω	3.5Ω	1.411		
40	Osc. Coil	1Ω	8Ω	1.402-1	14-1040#	#Add 50 MMFD cap. from grid to high side tuning cap.
41	Input IF	45Ω	43Ω	1.259	16-6658	
42	Output IF	42Ω	44Ω	1.409	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					GAROD PART No.		
43	Bayonet	6-8	0.15	Brown			Type 47

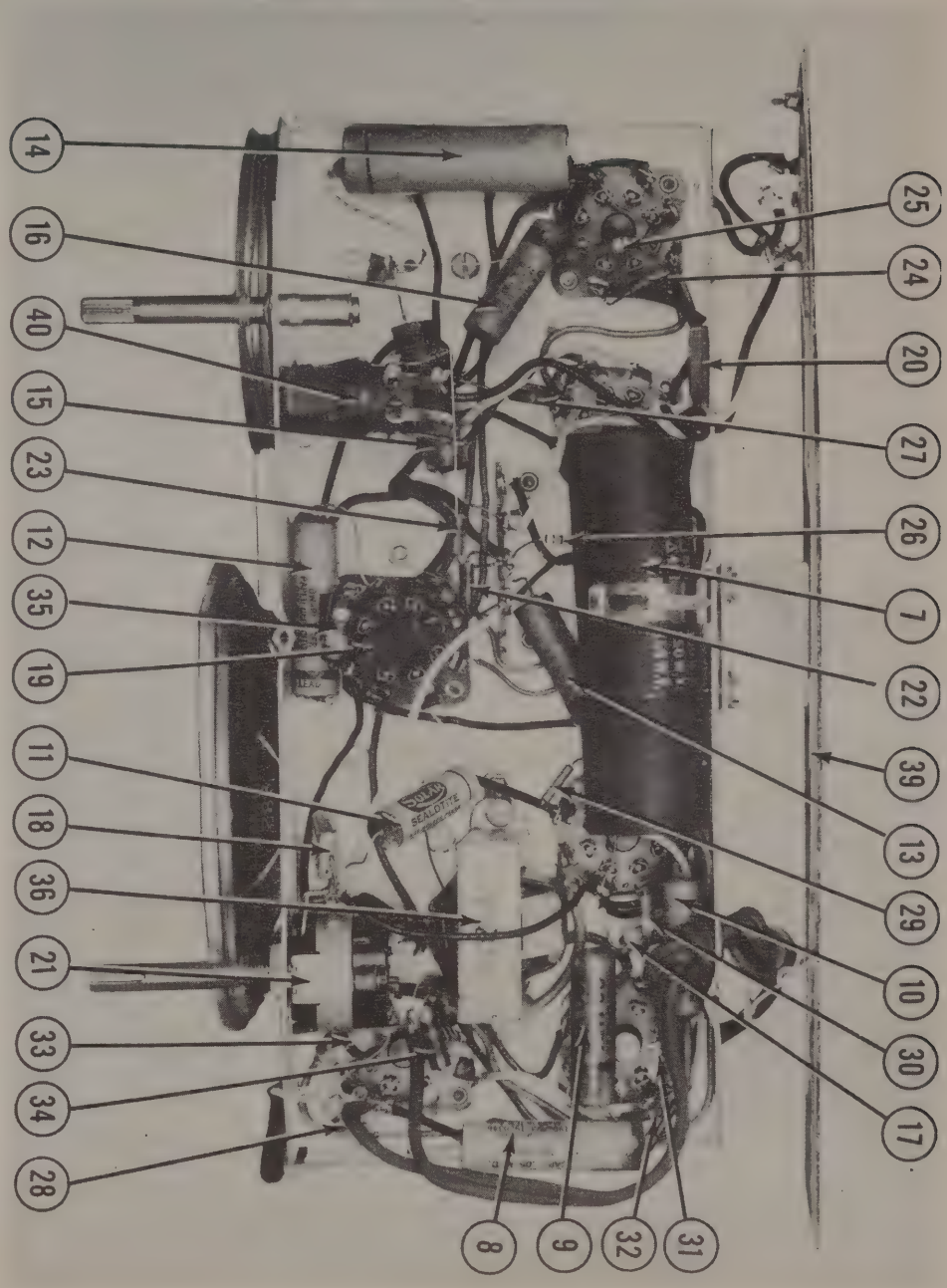
MISCELLANEOUS

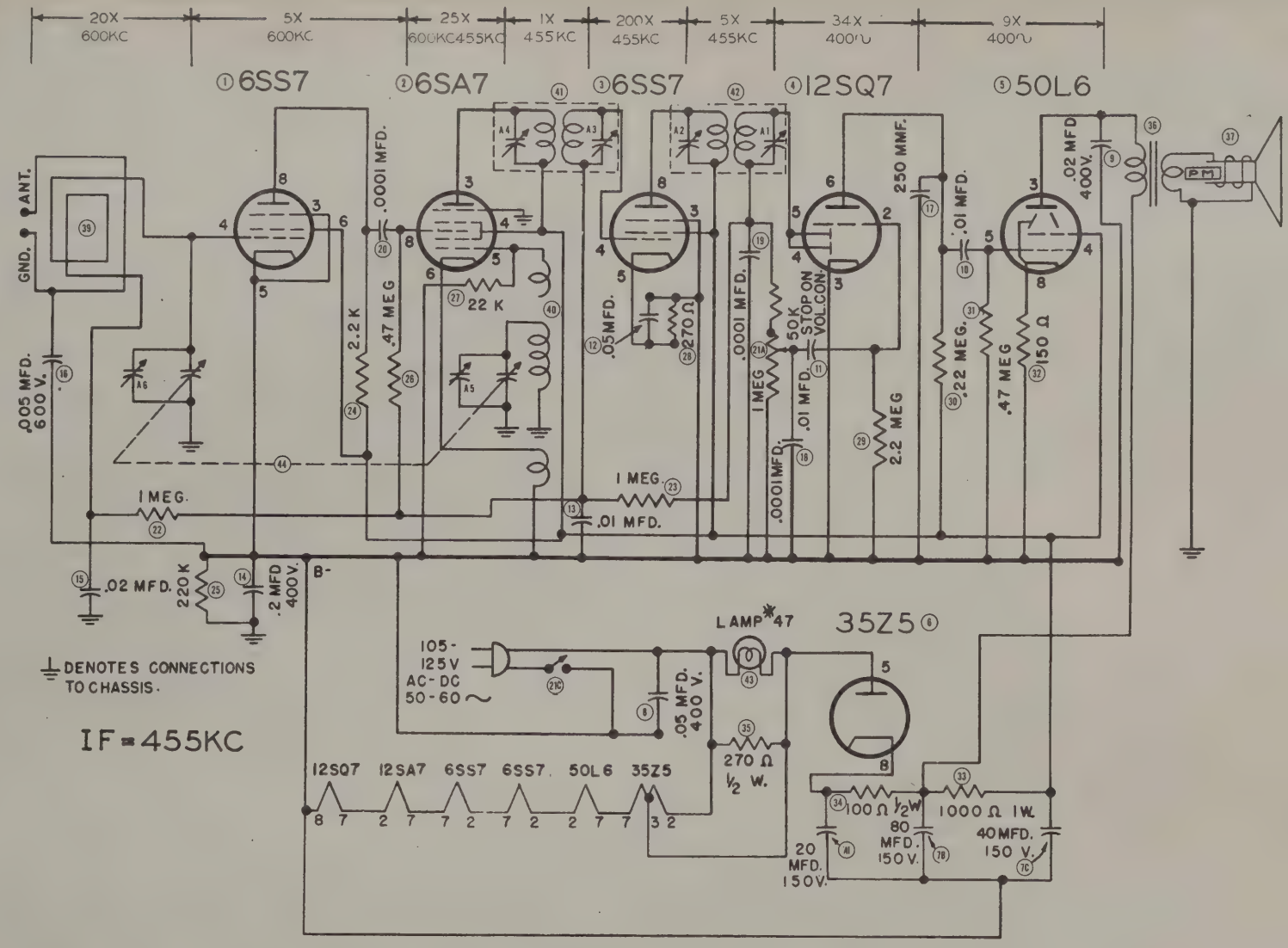
ITEM No.	PART NAME	GAROD PART No.	NOTES
44	Tuning Cap.	2.163	2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SS7	0V	31.5V.AC	0V	-.37V. DC	0V	77V.DC	2.5V.AC	57V. DC
2	12SA7	0V	125V.AC	77V. DC	77V. DC	-5.4V.DC	0V	25V.AC	-.02V.DC
3	6SS7	0V	37.5V.AC	0V	-.05V. DC	1.8V. DC	77V.DC	31.5V.AC	77V. DC
4	12SQ7	0V	-.3V. DC	0V	-.2V. DC	-.2V. DC	44V.DC	12.5V.AC	0V
5	50L6GT	0V	37.5V.AC	102V.DC	77V. DC	0V	0V	88V. AC	5V. DC
6	35Z5GT	0V	117V. AC	113V. AC	77V. DC	113V. AC	107V. DC	88V. AC	114V. DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	6SS7	240KΩ	31Ω	0Ω	2.8 MEG	0Ω	58KΩ	25Ω	60KΩ
2	12SA7	240KΩ	12.5Ω	58KΩ	58KΩ	26KΩ	.75Ω	25Ω	2.5MEG
3	6SS7	240KΩ	36Ω	0Ω	2MEG	260Ω	58KΩ	31Ω	58KΩ
4	12SQ7	240KΩ	1.8 MEG	0Ω	960KΩ	960KΩ	278KΩ	12.5Ω	0Ω
5	50L6GT	1 N F	36Ω	58KΩ	58KΩ	480KΩ	0Ω	88Ω	135Ω
6	35Z5GT	1 N F	113Ω	110Ω	58KΩ	110Ω	58KΩ	86Ω	58KΩ

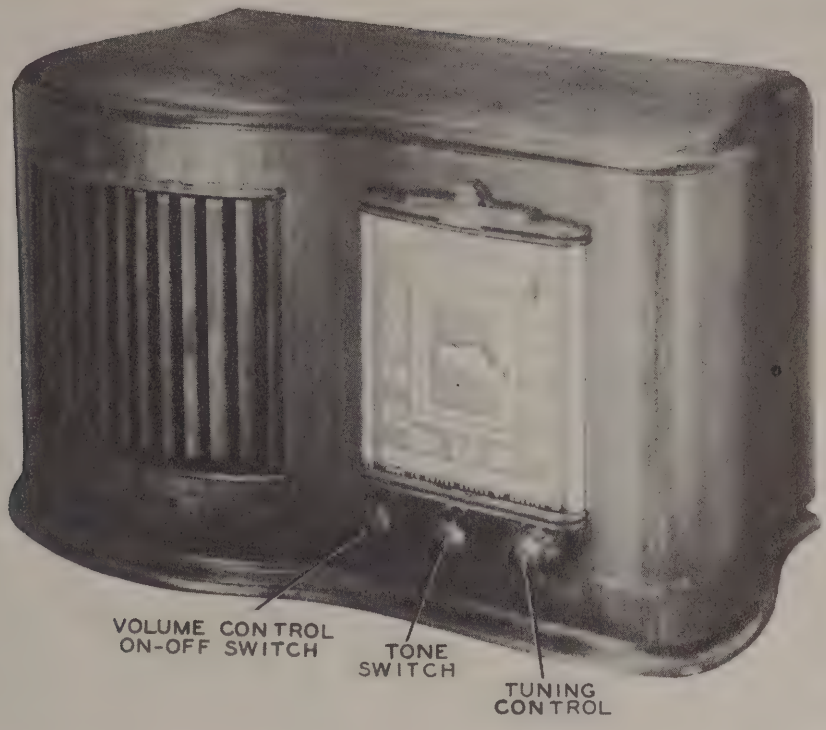
Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-29

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SONORA
MODEL RCU-208



SONORA
MODEL RCU-208

SONORA MODEL RCU-208

TRADE NAME	Sonora Model RCU-208
MANUFACTURER	Sonora Radio & Television Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 12SK7 2nd AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC RATING .230 Amps. @ 117V AC
TUNING RANGE—BROADCAST	535-1620KC **SHORT WAVE**

ALIGNMENT INSTRUCTIONS

Place loop and chassis on bench in same relative position as they occupy in cabinet. Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control in maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting. DO NOT ALIGN ON METAL BENCH.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1	High side to pin 8 of 12SA7. Low side to B-.	455KC	High freq.end of dial.(Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
100 MMF	High side to ant. lead. Low side to B-.	1620KC	"	"	A5	" " " "
"	"	1400KC	Tune to maximum output.	"	A6	" " " "
"	"	600KC	"	"		Check coil alignment.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: SONORA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-1st AF	12SQ7	12SQ7	8Q	
4	2nd AF	12SK7	12SK7	8N	
5	Power Output	35L6GT	35L6GT	7AC	
6	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SONORA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	40	150	N-3658	2N511	M-2x40-150	TA-440	PRSA150-40-40	BRD4415	Filter - Blue
B	40	150							" - Red
8	6	150	N-1367	TC42	M-8-150	UT-81	PRS150-8	BR815	1st Audio Plate Decoup.
9	.05	400	N-1346	TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
10	.05	200	N-1345	TP426	S-4-05	TC-15	484-05	DT4S5	Feedback
11	.02	400	N-1376	TP423	S-4-02	TC-12	484-02	DT4S5	35L6 Plate Bypass
12	.1	200	N-1351	TP428	S-4-1	TC-1	484-.1	DT4P1	Tone Compensation
13	.01	400	N-1903	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
14	.015	400	N-4927	TP400	S-4-01	TC-11	484-01	DT4S1	Feedback
15	.003	600	N-2063	TP406	S-6-003	TC-23	684-003	DT6D3	Audio Coupling
16	.0005	600	N-4890	TP403	S-6-0005	TC-35	1468-0005	DT6T5	1st Audio Plate Bypass
17	.005	600	N-4894	TP408	S-6-005	TC-25	684-005	DT6D5	Audio Coupling
18	.09	200	N-4957	TP428	S-4-1	TC-1	484-.1	DT4P1	Line Isolating
19	.05	200	N-1345	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
20	100	500	N-1374	MC237	M0.5-31	1FM-31	1466-0001	5W5T1	IF Bypass Diode
51	10	500		MC215	M0.5-41	1FM-41	1468-00001	5W5Q1	Fixed Trimmer *

*Not used on all models.

CONTROLS

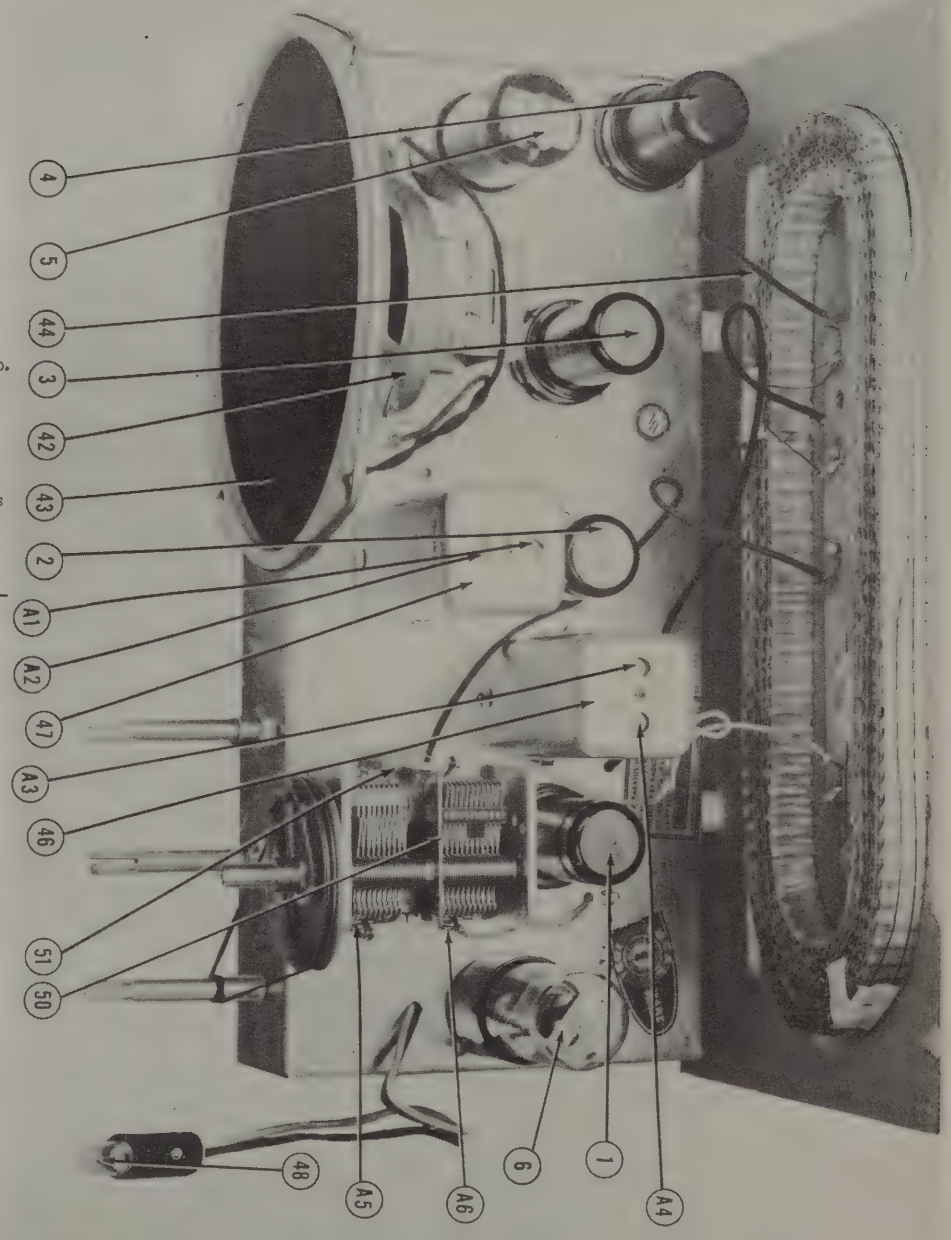
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SONORA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21A	500KΩ	1	N-4889	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 21A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SONORA PART No.	IRC PART No.	IDENTIFICATION CODES
22	22KΩ	½	N-4025	BTS-22K	Red-Red-Or. Osc. Grid
23	220KΩ	½	N-4026	BTS-220K	Red-Red-Yl. Line Isolating
24	3.3 Meg.	½	N-4062	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
25	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter*
26	4.7 Meg.	½	N-4061	BTS-4.7 Meg.	Yl.-Vi.-Grn. 1st AF Grid
27	10KΩ	½	N-4895	BTS-10K	Br.-Blk.-Or. 1st AF Plate Load
28	100KΩ	½	N-1778	BTS-100K	Br.-Blk.-Yl. 1st AF Plate Filter
29	4.7 Meg.	½	N-4061	BTS-4.7 Meg.	Yl.-Vi.-Grn. 2nd AF Grid
30	2200Ω	½	N-4896	BTS-2200	Red-Red-Red 2nd AF Cathode
31	220KΩ	½	N-4899	BTS-220K	Red-Red-Yl. 2nd AF Plate Load
32	1.2 Meg.	½	N-4470	BTS-1.2 Meg.	Br.-Red-Grn. 2nd AF Screen Dropping
33	22KΩ	½	N-5029	BTS-22K	Red-Red-Or. Tone Compensation
34	8200Ω	½	N-4897	BTS-8200	Gray-Red-Red " "
35	180Ω	½	N-4067	BW-½-180	Br.-Gray-Br. Output Cathode
36	470KΩ	½	N-4027	BTS-470K	Yl.-Vi.-Yl. Output Grid
37	1200Ω	1	N-4900	BTA-1200	Br.-Red-Red Filter
38	33Ω	1	N-4068	BW-1-33	Or.-Or.-Blk. Surge Limiter
39	22KΩ	½	N-5029	BTS-22K	Red-Red-Or. Feedback*
40	33Ω	1	N-4068	BW-1-33	Or.-Or.-Blk. Line Dropping

*Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA SONORA PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA THORDAR'N PART No.	REPLACEMENT DATA	INSTALLATION NOTES
41	2100Ω	2.6Ω	205Ω tapped @ 7.5Ω	.55Ω	N-4875	A-3876†			†Add filter if necessary to reduce hum level.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA SONORA PART No.	REPLACEMENT DATA JENSEN PART No.		INSTALLATION NOTES
42	FIELD PM	VC IMP. 3.35Ω	N-4869	ST-109‡ Mod. P6-W		‡Fabricate new mounting bracket.
43	CONE DIA. 6"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

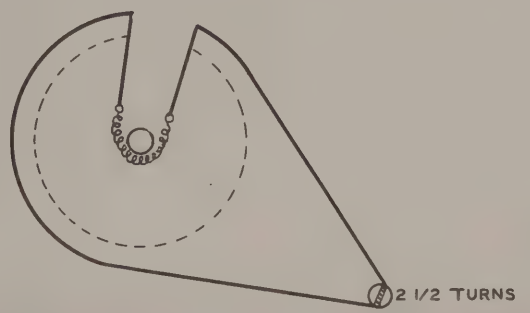
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA SONORA PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
44 45	Loop Ant. Osc. Coil	0Ω .8Ω	.3Ω 6.1Ω	N4877 N4810	14-1040	Add 50 MMFD cap from grid to high side tuning cap.
46	Input IF	12.6Ω	14.5Ω	N4872	16-6658	
47	Output IF	23.9Ω	21Ω	N4873	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA SONORA PART No.	REPLACEMENT DATA	INSTALLATION NOTES
48	Bayonet	6-8	0.15	Brown			Type 47

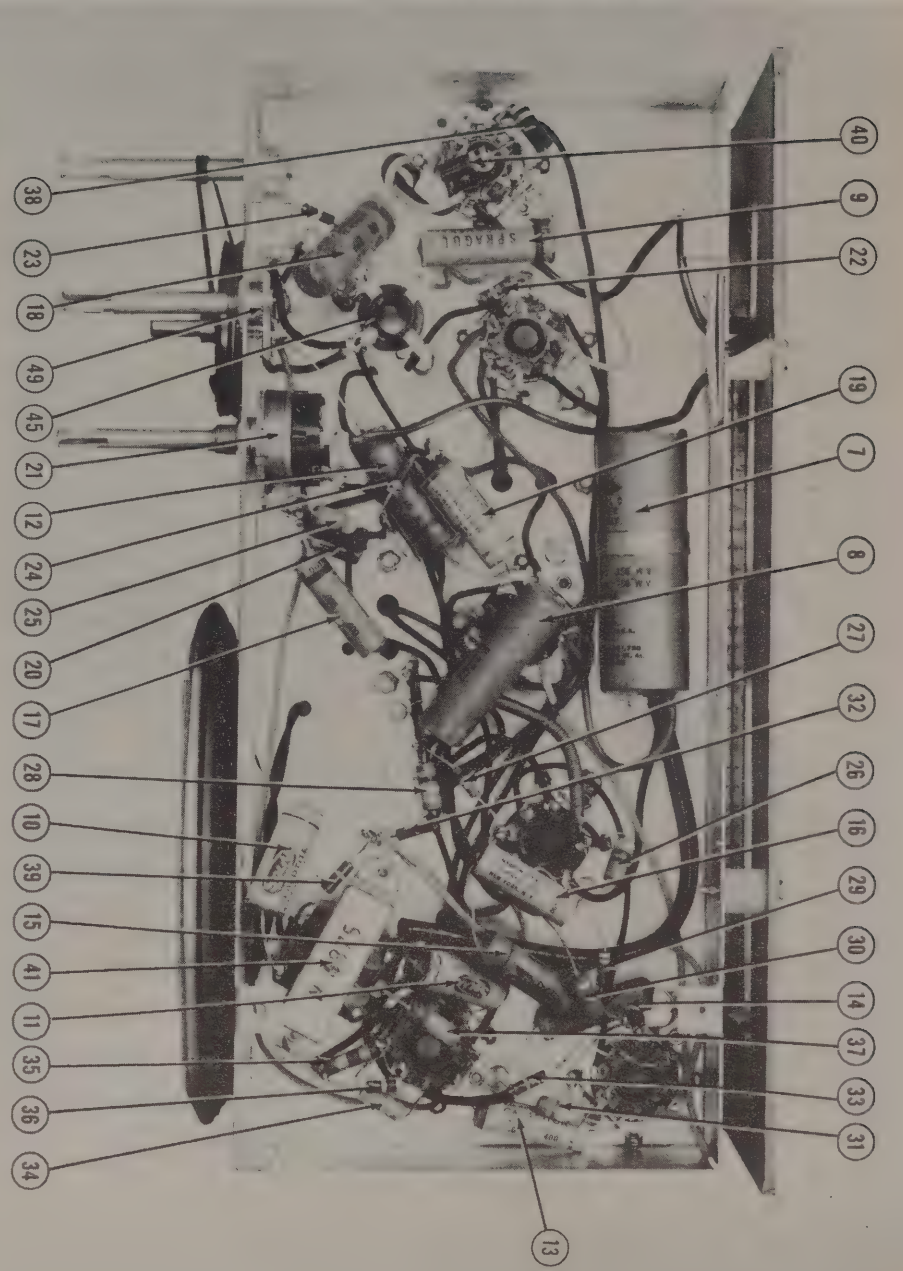
MISCELLANEOUS

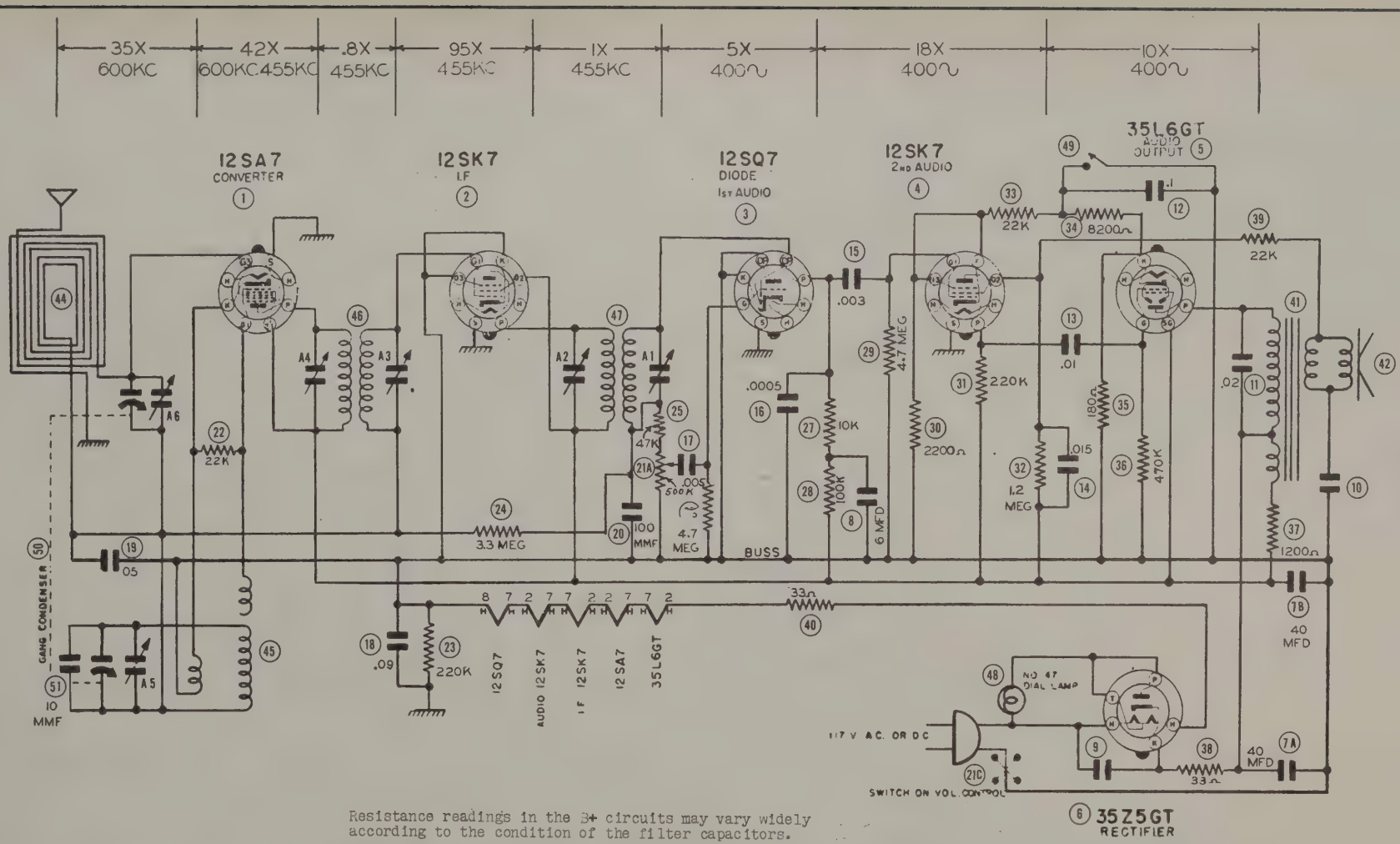
ITEM No.	PART NAME	SONORA PART No.	NOTES
49	Tone Switch	N-4634	SPST
50	Tuning Cap.	N-4876	2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0 V.	35.8V.AC	82V.DC	82V.DC	-2.8V.DC	0 V.	47V.AC	-.25V.AC
2	12SK7	0 V.	35.8V.AC	0 V.	-.25V.DC	0 V.	82V.DC	24.2V.AC	82V.DC
3	12SQ7	0 V.	-3V.DC	0 V.	0 V.	-.15V.DC	60V.DC	12.5V.AC	0 V.
4	12SK7	0 V.	12.5V.AC	.5V.DC	0 V.	.5V.DC	84V.DC	24.2VAC	30V.DC
5	35L6GT	0 V.	83V.AC	110V.DC	82V.DC	0 V.	0 V.	47V.AC	5.2V.DC
6	35Z5GT	0 V.	117V.AC	113V.AC	83V.AC	113V.AC	115V.DC	87V.AC	117V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	195KΩ	35Ω	66KΩ	66KΩ	20KΩ	.5Ω	46Ω	3.2MEG
2	12SK7	195KΩ	35Ω	0Ω	3.2MEG	0Ω	66KΩ	24Ω	66KΩ
3	12SQ7	195KΩ	4.5MEG	0Ω	0Ω	530KΩ	138KΩ	12Ω	0Ω
4	12SK7	195KΩ	12Ω	1800Ω	4.5MEG	1800Ω	1.4MEG	24Ω	286KΩ
5	35L6GT	INF	78Ω	66KΩ	66KΩ	425KΩ	0Ω	46Ω	180Ω
6	35Z5GT	INF	135Ω	132Ω	78Ω	132Ω	66KΩ	105Ω	66KΩ

I.F.—455 K.C.

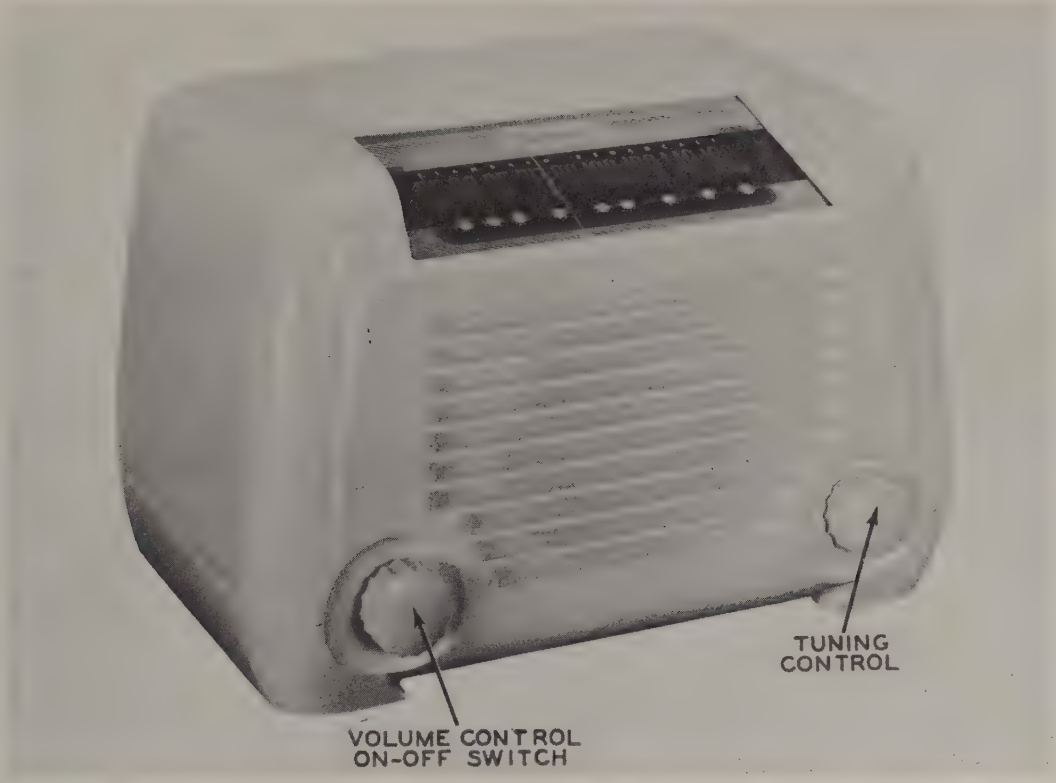
465-30

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

SONORA
MODEL RBU-176



SONORA
MODEL RBU-176

SONORA MODEL RBU-176

TRADE NAME	Sonora Model RBU-176
MANUFACTURER	Sonora Radio & Television Corp., 325 N. Hoyne Ave., Chicago, Ill.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7 Converter, 12SK7 IF Amp., 12SQ7 Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-DC RATING .235 Amps. @ 117V AC
TUNING RANGE—BROADCAST	535-1620KC

ALIGNMENT INSTRUCTIONS

Place chassis and loop antenna on bench so that they occupy exactly the same respective position on the bench as they did in the cabinet. Use isolating transformer if available. If not, connect capacitor in series with low side of signal generator to ground buss. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting. DO NOT ALIGN ON METAL BENCH.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin 8 of 12SA7. Low side to ground buss.	455KC	High freq.end of dial. (Variable fully open)	Across voice coil	A1,A2, A3.	Adjust for maximum output.
100MMF	High side to ant. lead. Low side to ground buss.	1620KC	"	"	A4	" " " "
"	"	1400KC	Tune for maximum output.	"	A5	" " " "
"	"	600KC	"	"		Check alignment of coils.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: SONORA PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7	12SA7	8R	
2	IF Amp.	12SK7	12SK7	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	35L6GT	35L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: SONORA PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	35	150	N-3302	2N511	M-2x40-150	TA-430	PRSA150-40-40	BRD4415	Filter - Green
B	30	150							" - Red
7	.05	400	N-1346	TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.02	400	N-1376	TP423	S-4-02	TC-12	484-02	DT4S2	35L6 Plate Bypass
9	.01	400	N-1344	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
10	.004	400	N-2712	TP407	S-6-004	TC-24	484-004	DT6D4	" "
11	.0005	400	N-1447	TP403	S-6-0005	TC-35	1468-0005	DT6T5	Audio Plate Bypass
12	.05	200	N-1345	TP426	S-4-05	TC-15	484-05	DT4S5	Line Isolating
13	.05	200	N-1345	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
14	100	500	N-1374	MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Diode
15	10	500		MC215	M0.5-41	MS-41	1466-00001	5W5Q1	Fixed Trimmer*

*Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SONORA PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500KΩ	1	N4999	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
16A	500KΩ	1	N4843	MK401†	D13-133†	AM-60-Z†	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

† Install a 50KΩ resistor in series with the right hand terminal of the control and the lead connecting to the same terminal of the original control. (Control viewed from shaft side, terminals down.)

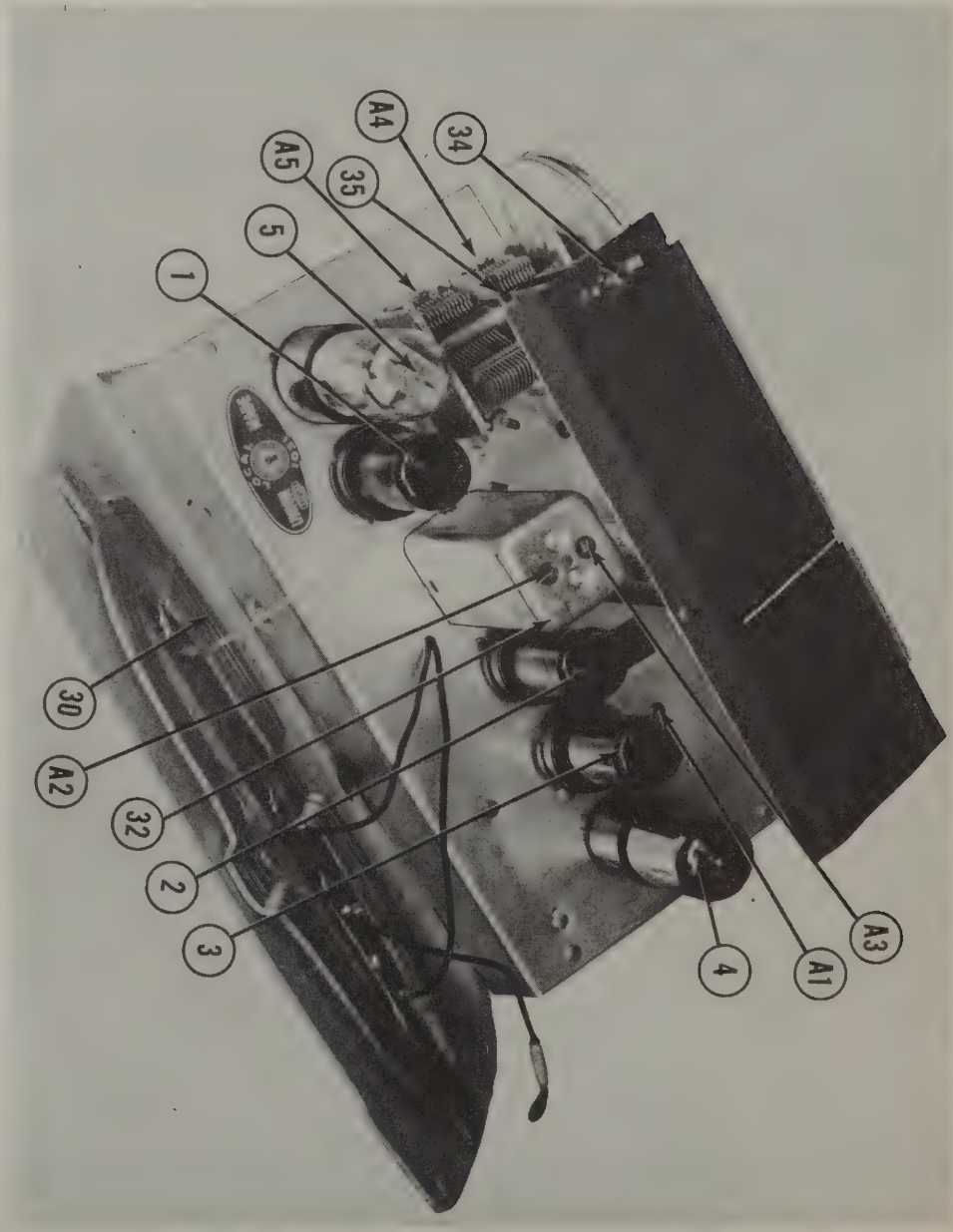
RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: SONORA PART No.	IRC PART No.	IDENTIFICATION CODES
17	22KΩ	½	N-4025	BTS-22K	Red-Red-Or. Osc. Grid
18	220KΩ	½	N-4026	BTS-220K	Red-Red-Yl. Line Isolating
19	1 Meg.	½	N-1262	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
20	6.8 Meg.	½	N-4028	BTS-6.8 Meg	Blue-Gray-Grn. 1st AF Grid
21	220KΩ	½	N-4026	BTS-220K	Red-Red-Yl. 1st AF Plate Load
22	220Ω	½	N-4024	BW-½-220	Red-Red-Br. Output Cathode
23	470KΩ	½	N-4027	BTS-470K	Yl.-Vi.-Yl. Output Grid
24	1000Ω	½	N-3341	BTS-1000	Br.-Blk.-Red Filter
25	33Ω	½	N-4022	BW-½-33	Or.-Or.-Blk. Surge Limiter
26	82Ω	2	N-4023	BW-2-82	Gray-Red-Blk. Line Dropping

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: SONORA PART No.	STANCOR PART No.	THORDAR'N PART No.		INSTALLATION NOTES
27	3000Ω	2.9Ω	300Ω	.6Ω	N-3899	A-3878	T-22S45		

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SONORA PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-113		
28	PM	2.9Ω	N-4318	Mod. P4-X		
	CONE DIA.	VC DIA.				
29	3-15/16"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

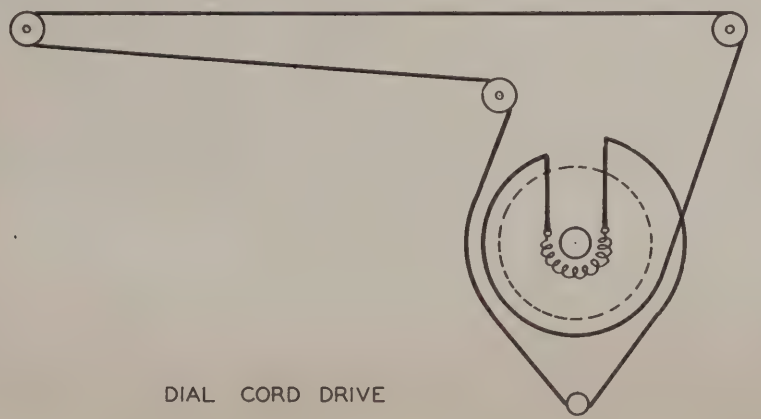
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	SONORA PART No.	MEISSNER PART No.	
30	Loop Ant.	0Ω	1.6Ω	N4815		
31	Osc. Coil	8Ω	6.1Ω	N4810	14-1040	Add 50 MMFD cap. from grid to high end of tuning gang.
32	Input IF	21Ω	20Ω	N4813	16-6658	
33	Output IF	29Ω	29Ω	N4846		

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					SONORA PART No.		
34	Bayonet	6-8	0.15	Brown			Type 47

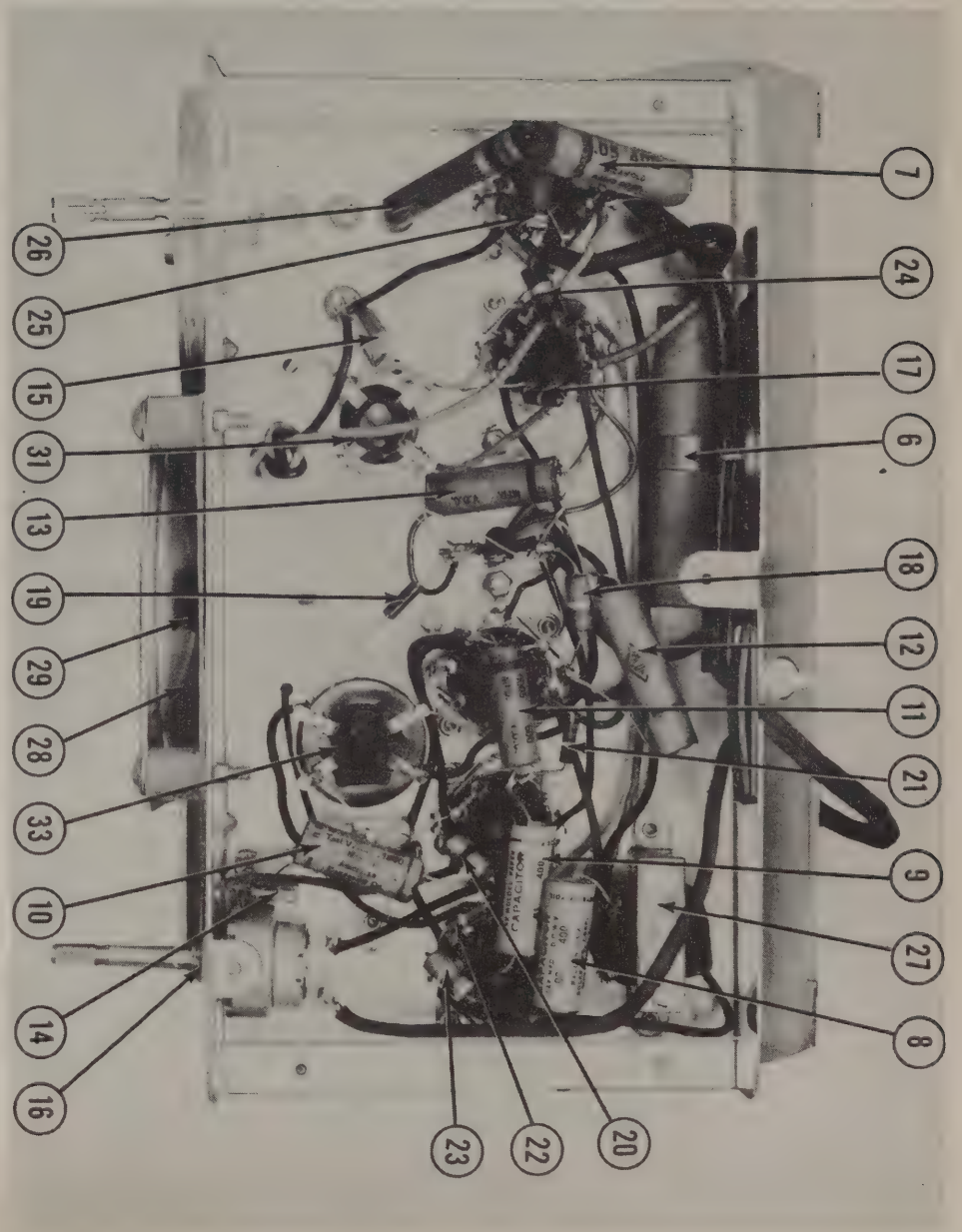
MISCELLANEOUS

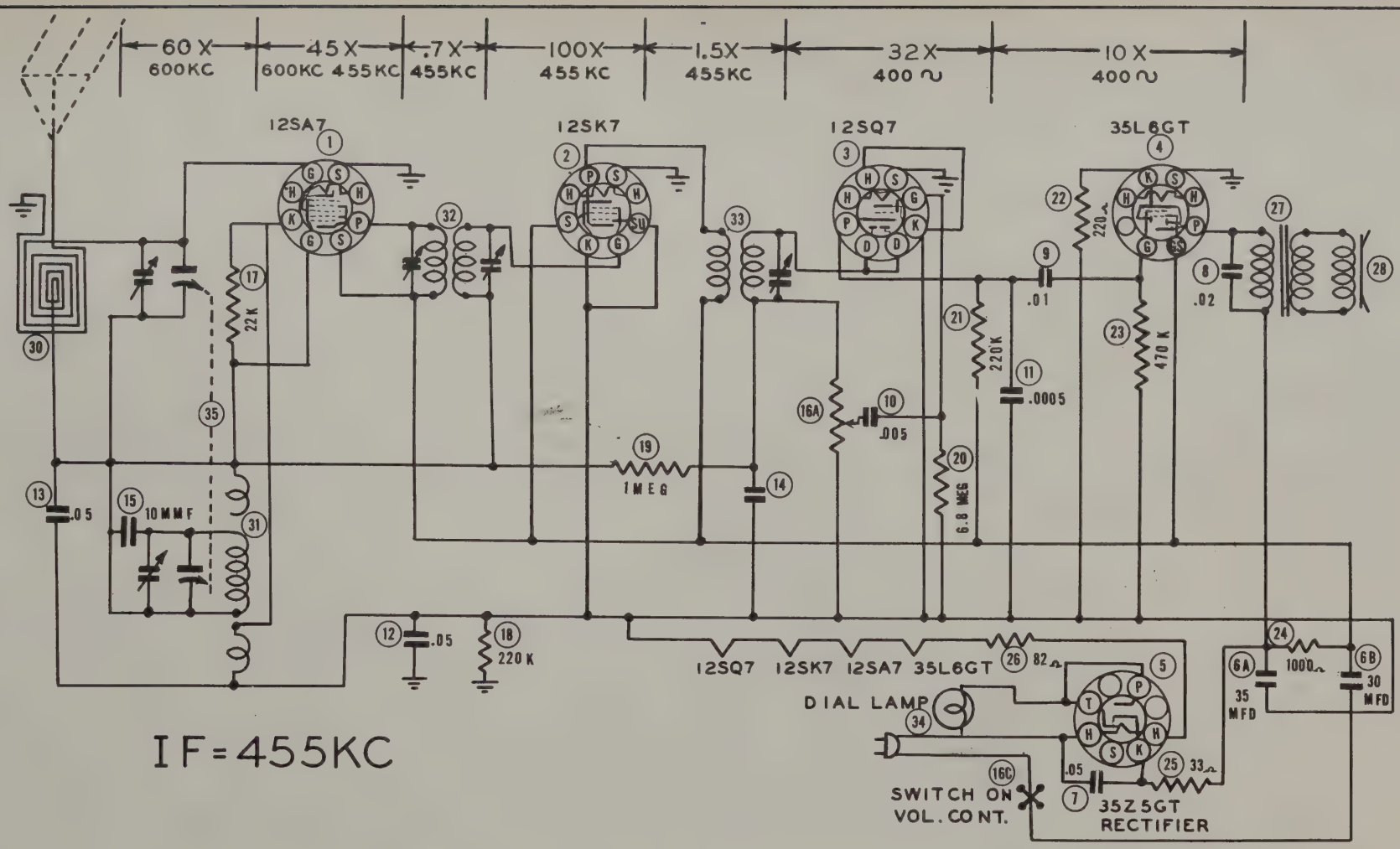
ITEM No.	PART NAME	SONORA PART No.	NOTES
35	Tuning Cap.	N-4812	2 Gang Variable



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	OV	37.5V.AC	88V. DC	88V. DC	-3.8V.DC	OV	25V. AC	-.25V. DC
2	12SK7	OV	12.5V.AC	OV	-.25V.DC	OV	88V. DC	25V. AC	88V. DC
3	12SQ7	OV	-.55V. DC	OV	-.5V. DC	-.5V. DC	62V. DC	12.5VAC	OV
4	35L6GT	OV	37.5VAC	108V. DC	88V. DC	OV	OV	73V. AC	6.3V. DC
5	35Z5GT	OV	117V. AC	112V. AC	116V. DC	112 V.AC	73V. AC	87V. AC	117V. DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	205KΩ	34Ω	1.4 MEG	1.4 MEG	23KΩ	.5Ω	22.5Ω	1.3 MEG
2	12SK7	205KΩ	11.5Ω	0Ω	1.3 MEG	0Ω	1.4 MEG	22.5Ω	1.4 MEG
3	12SQ7	205KΩ	5.5 MEG	0Ω	470KΩ	470KΩ	1.6MEG	11.5Ω	0Ω
4	35L6GT	I N F	34Ω	1.4MEG	1.4 MEG	410KΩ	0Ω	67Ω	215Ω
5	35Z5GT	I N F	173Ω	170Ω	1.4 MEG	170Ω	67Ω	140Ω	1.4MEG

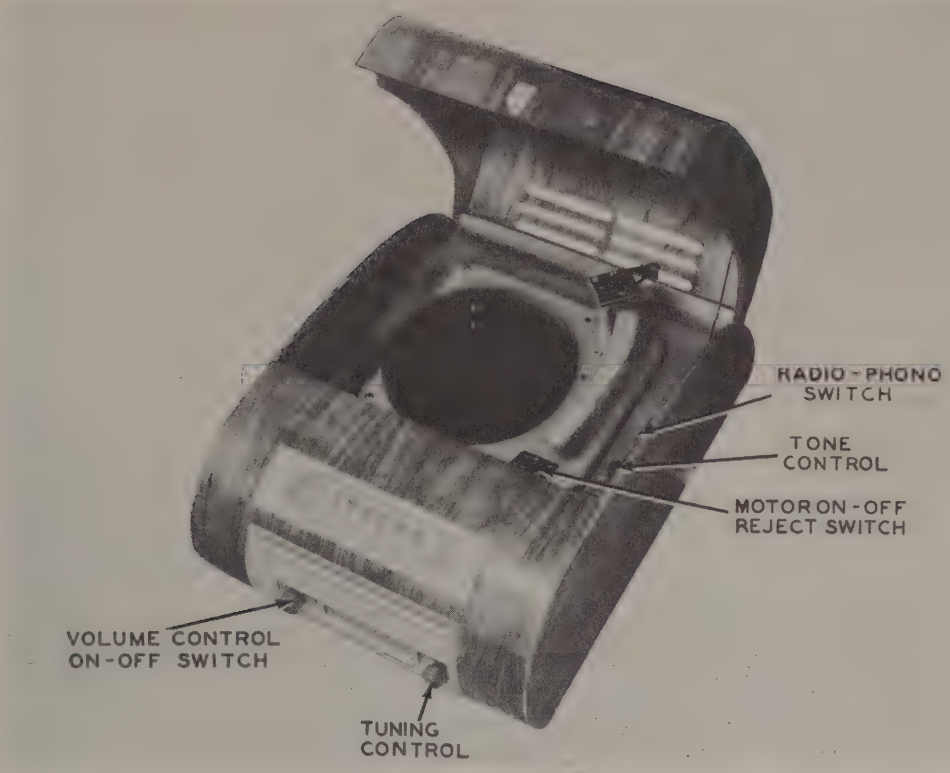
Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

465-31

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

ELECTROMATIC
MODELS 606A, 607A



ELECTROMATIC
MODELS 606A, 607A

ELECTROMATIC MODEL 607A

TRADE NAME	Electromatic Model 606A, 607A
MANUFACTURER	Electromatic Mfg. Corp., 88 University Place, New York 3, N.Y.
TYPE SET	AC Operated Combination Automatic Phono-Superheterodyne Receiver, Self Contained Loop Antenna.
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7 Det.-AVC-AF, 50L6GT Power Output, 35W4 or 35Z5 Rectifier.
POWER SUPPLY	117 Volts AC RATING - .240 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1720KC

ALIGNMENT INSTRUCTIONS

To set pointer, turn variable fully closed and set pointer at mark at left end of dial. Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to ground. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin 8 of 12SA7. Low side to chassis.	455KC	High freq. end of dial. (Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ant. lead. Low side to chassis.	1720KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: ELECTROMATIC PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7	12SQ7	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5A	Rectifier	35W4	35W4	5BQ	
B	Rectifier	35Z5	35Z5	6AD	Used in some models

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: ELECTRO-MATIC PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	50	150		2N520	M-50+30-150	TA-530	PRS15040-40	BRD3515	Filter *
B	30	150							"
6A	35	150		FP357	DY-3x40-150	EL-340	PRSA15040-40	EZ443150	" †
B	35	150					PRS150-40		"
C	35	150							"
7	10	50		TC32	M-10-50	TA-510	PRS50-10	BR105	Cath. Bypass
8	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
9	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	50L6 Plate Bypass
10	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
11	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Screen Bypass
12	.002	600		TP405	S-6-002	TC-22	684-002	DT6D2	Audio Coupling
13	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	Cath. Bypass
14	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
15	.002	600		TP405	S-6-002	TC-22	684-002	DT6D2	Ant. Coupling
16	.005	600		TP408	S-6-005	TC-25	684-005	DT6D5	Tone Compensation
17	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	Phono Shield Bypass
18	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Audio Plate Bypass
19	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	IF Bypass Diode
20	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	IF Bypass Vol. Cont.
21	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
22	200	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	Phono Coupling

*Used in initial production
†Used in later productions

CONTROLS

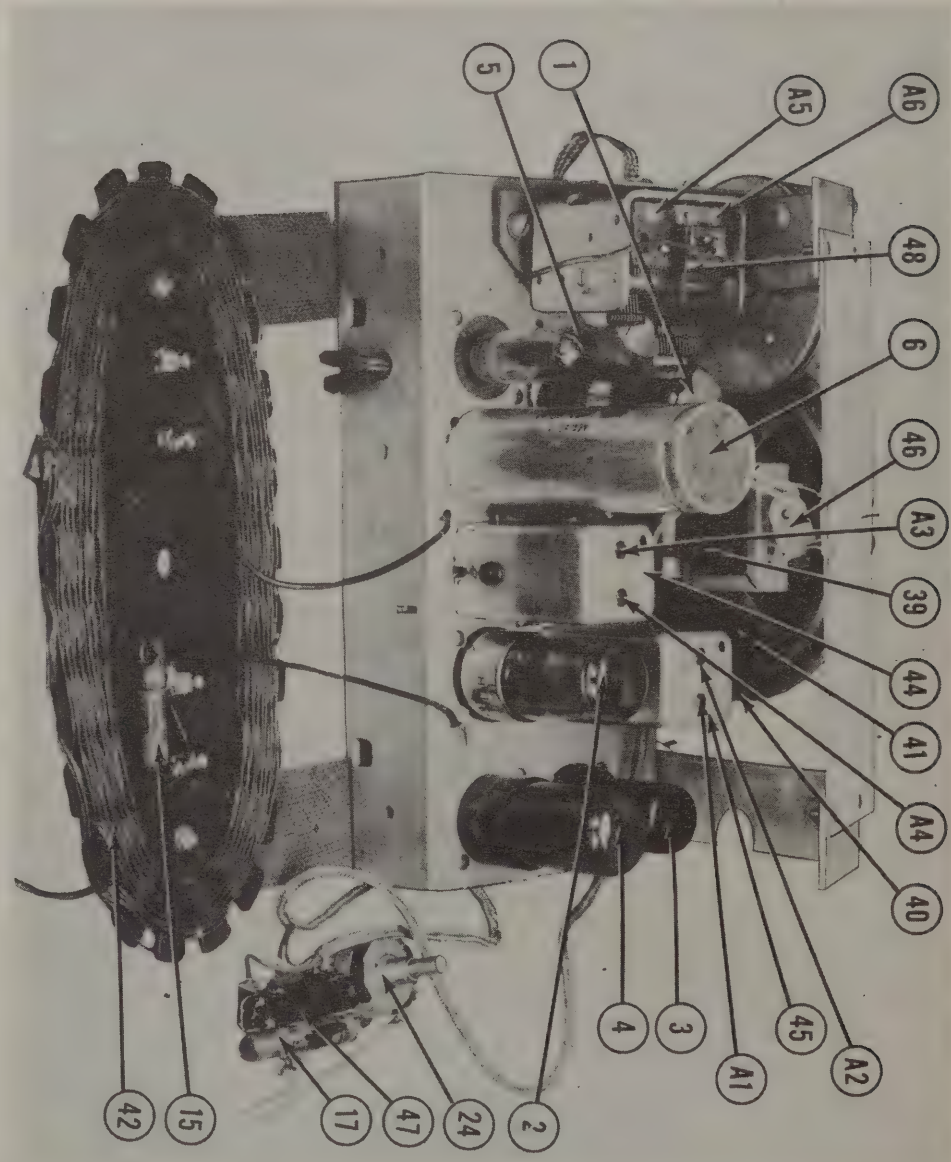
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ELECTRO-MATIC PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
23A	500KΩ	1	RVC-A120	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 23A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "
24A	500KΩ	1	111-C	MR48	D13-133	M-60-Z	Tone Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 24A per instructions

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: ELECTROMATIC PART No.	IRC PART No.	IDENTIFICATION CODES
25	20KΩ	½		BTS-22K	Red-Blk.-Or. Osc. Grid
26	2 Meg.	½		BTS-2.2 Meg.	Red-Blk.-Grn. AVC Network
27	47KΩ	½		BTS-47K	Yl.-Vi.-Or. IF Filter
28	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
29	250KΩ	½		BTS-270K	Red-Grn.-Yl. 1st AF Plate Load
30	500KΩ	½		BTS-470K	Grn.-Blk.-Yl. Output Grid
31	140Ω	½		BW-½-150	Br.-Yl.-Br. Output Cathode
32	500Ω	½		BTS-470	Grn.-Blk.-Br. Filter
33	400Ω	½		BTS-470	Yl.-Blk.-Br. Feedback
34	100Ω	½		BW-½-100	Br.-Blk.-Br. Feedback
35	1000Ω	½		BTS-1000	Br.-Blk.-Red Filter
36	100Ω	½		BW-½-100	Br.-Blk.-Br. Filter - See Note 1
37	250KΩ	½		BTS-270K	Red-Grn.-Yl. Series Phono.
38	20Ω	1		BW-1-22	Red-Blk.-Blk. Rectifier Ballast

Note 1 - Used in alternate filter circuit.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ELECTROMATIC PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA THORDAR'N PART No.	INSTALLATION NOTES
39	2000Ω	3.3Ω	145Ω	.6Ω		A-3876‡	T-22S45‡	‡Bend mounting tabs down, file out slots and mount on original bracket.

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ELECTROMATIC PART No.	REPLACEMENT DATA JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
40	PM	3.3Ω		ST-107 Mod. P5-V		
	CONE DIA.	VC DIA.				
41	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ELECTROMATIC PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
42	Loop Ant.	0Ω	1Ω			
43	Osc. Coil		5Ω		14-1040	
44	Input IF	16Ω	17Ω		16-6658	
45	Output IF	14.5Ω	15Ω		16-6660	

DIAL LIGHT

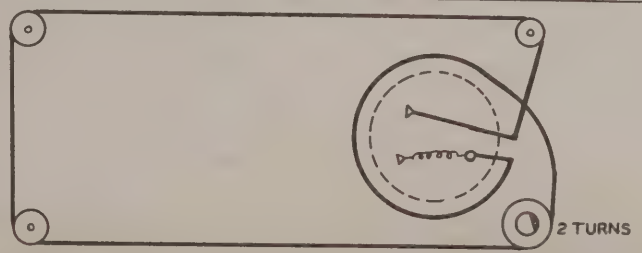
ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ELECTROMATIC PART No.		INSTALLATION NOTES
46	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

ITEM No.	PART NAME	ELECTROMATIC PART No.	NOTES
47	Switch		Radio-Phono
48	Tuning Cap.		2 Gang Variable Cap.

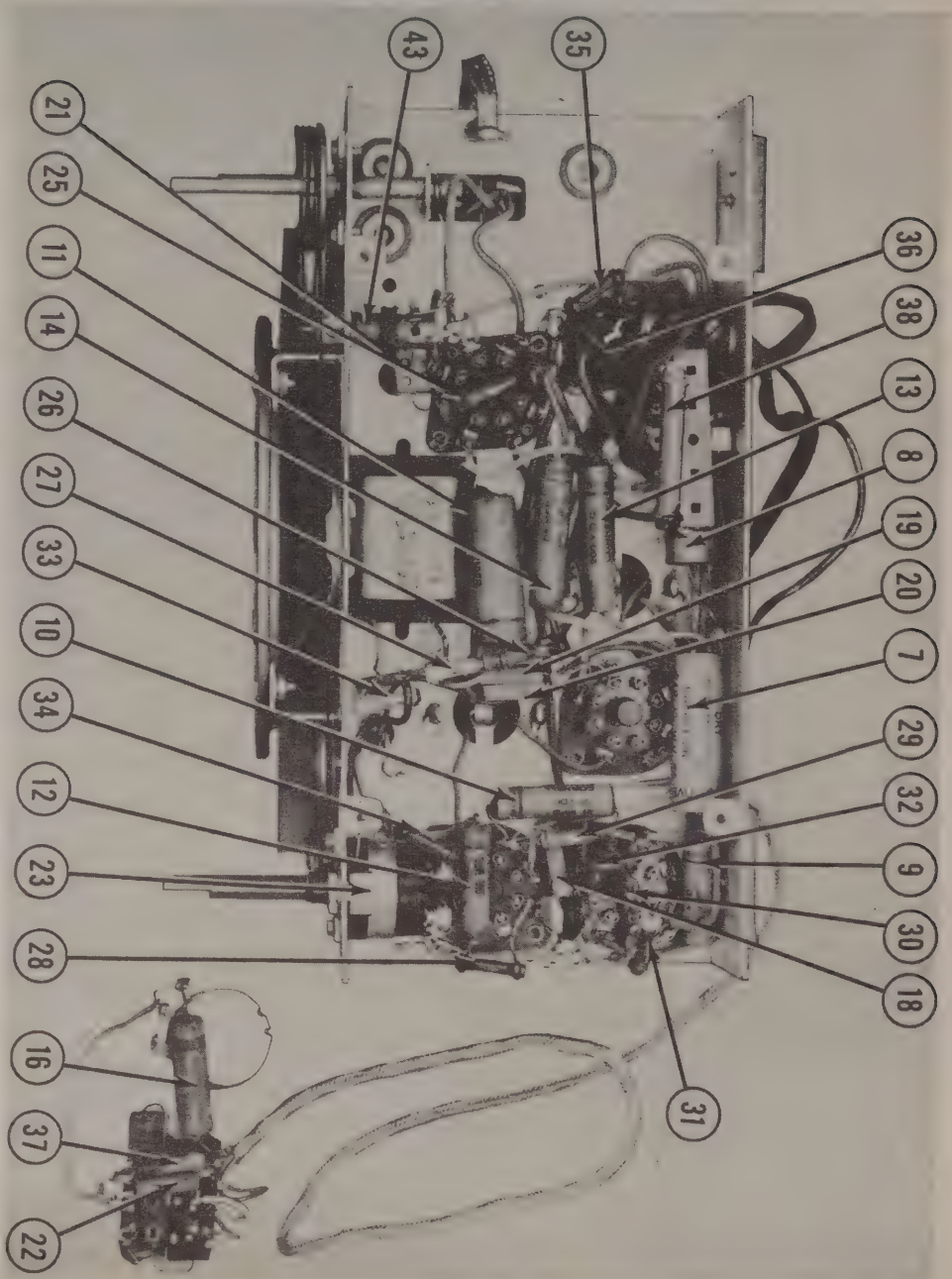
DISASSEMBLY INSTRUCTIONS

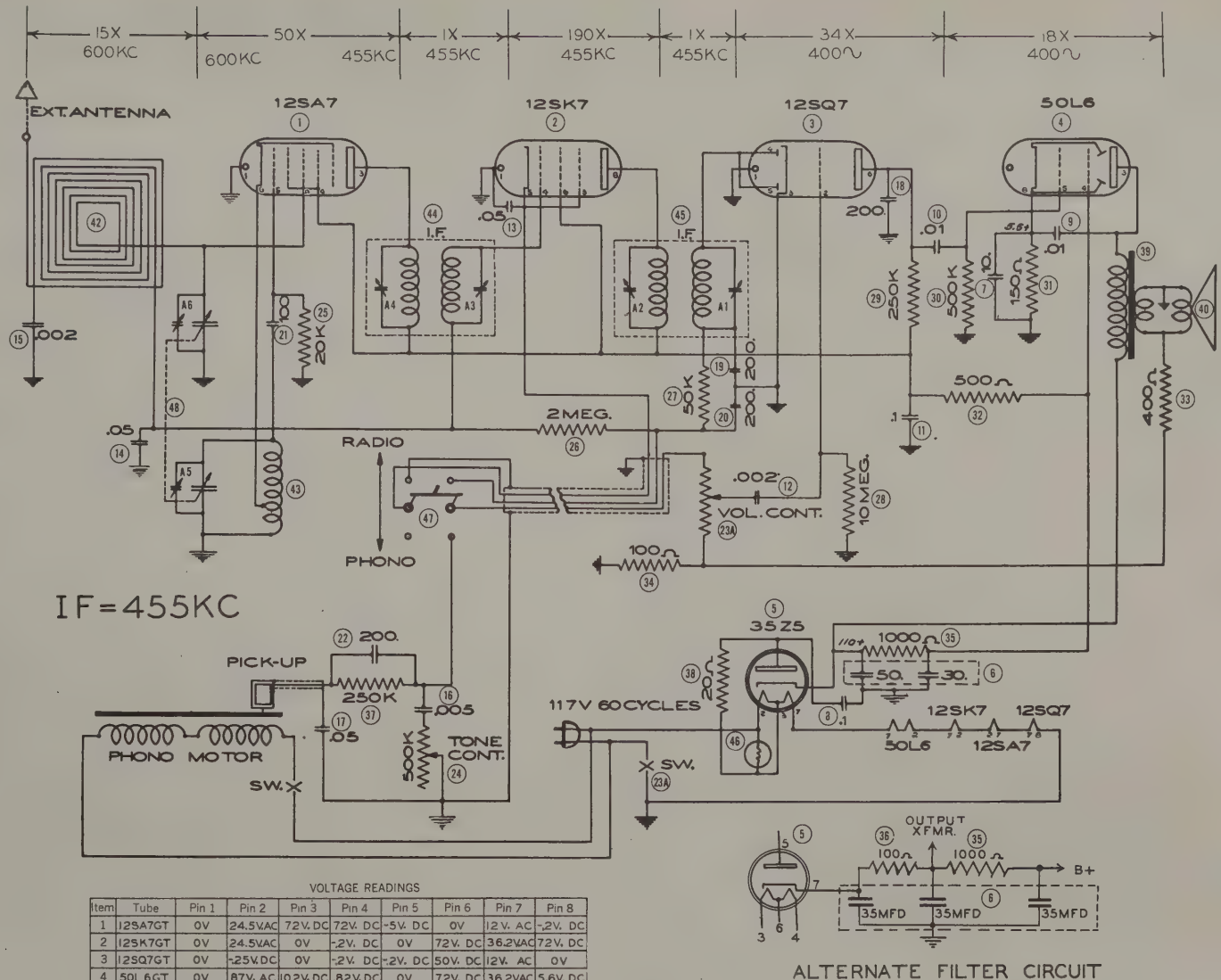
1. Remove volume and tuning control push-on type knobs.
2. Remove screw type tone control knob and lock nut.
3. Remove two screws holding radio-phono switch.
4. Remove four screws and washers holding motor board to cabinet.
5. Remove two screws holding cover bracket to cabinet.
6. Remove four screws from back board holding chassis to cabinet. Remove board.
7. Lift turntable assembly and radio chassis from cabinet.
8. Unsolder pick-up lead from on-off switch.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	24.5V.AC	72V. DC	72V. DC	-5V. DC	0V	12 V. AC	-2V. DC
2	12SK7GT	0V	24.5V.AC	0V	-2V. DC	0V	72V. DC	36.2VAC	72V. DC
3	12SQ7GT	0V	-25V.DC	0V	-2V. DC	-2V. DC	50V. DC	12V. AC	0V
4	50L6GT	0V	87V. AC	102V. DC	82V. DC	0V	72V. DC	36.2VAC	5.6V. DC
5	35W4	107V. DC	82V. DC	87V. AC	117V. AC	112V. AC	113V. AC	113V. DC	

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	26Ω	190KΩ	190KΩ	20KΩ	.5Ω	13Ω	2.8 MEG
2	12SK7GT	0Ω	26Ω	0Ω	2.8MEG	0Ω	190KΩ	40 Ω	190KΩ
3	12SQ7GT	0Ω	8 MEG	0Ω	560KΩ	560KΩ	440KΩ	13 Ω	0Ω
4	50L6GT	0Ω	90Ω	190KΩ	190KΩ	500KΩ	190KΩ	40Ω	140Ω
5	35W4	190KΩ	190KΩ	90Ω	120Ω	138Ω	118Ω	190 KΩ	

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-32

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

BELLTONE
MODEL 500

BELLTONE
MODEL 500

BELLTONE MODEL 500

TRADE NAME	Belltone Model 500
MANUFACTURER	Jewel Radio Corp., 583 Sixth Ave., New York, N.Y.
TYPE SET	AC - DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volts AC — RATING .230 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1700KC — SHORT WAVE

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of front section of variable. Low side to chassis.	455KC	High freq.end of dial.(Variable fully open.)	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ext. ant. lead. Low side to chassis.	1700KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		BELLTONE PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	BELLTONE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
6A	50	150		2N520	M-50+30-150	TA-530	PRSA150-40-40	BRL3515	Filter - Red
B	30	150							" - Yellow
7	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	50L6 Plate Bypass
9	.02	400		TP423	S-4-02	TC-12	484-02	DT4S2	Audio Coupling
10	.006	400		TP409	S-6-006	TC-26	464-006	DT6D6	Audio Coupling
11	.05	200		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
12	.01	400		TP421	S-4-01	TC-11	484-01	DT4S1	Ant. Coupling
13	250	300		MC240	M0.5-325	1FM-325	1438-00025	5W5T25	Audio Plate Bypass
14	250	300		MC240	M0.5-325	1FM-325	1468-00025	5W5T25	IF Bypass Vol. Cont.
15	50	300		MC225	M0.5-45	1FM-45	1468-00005	5W5Q5	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	BELLTONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	500KΩ	1	CM1264	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

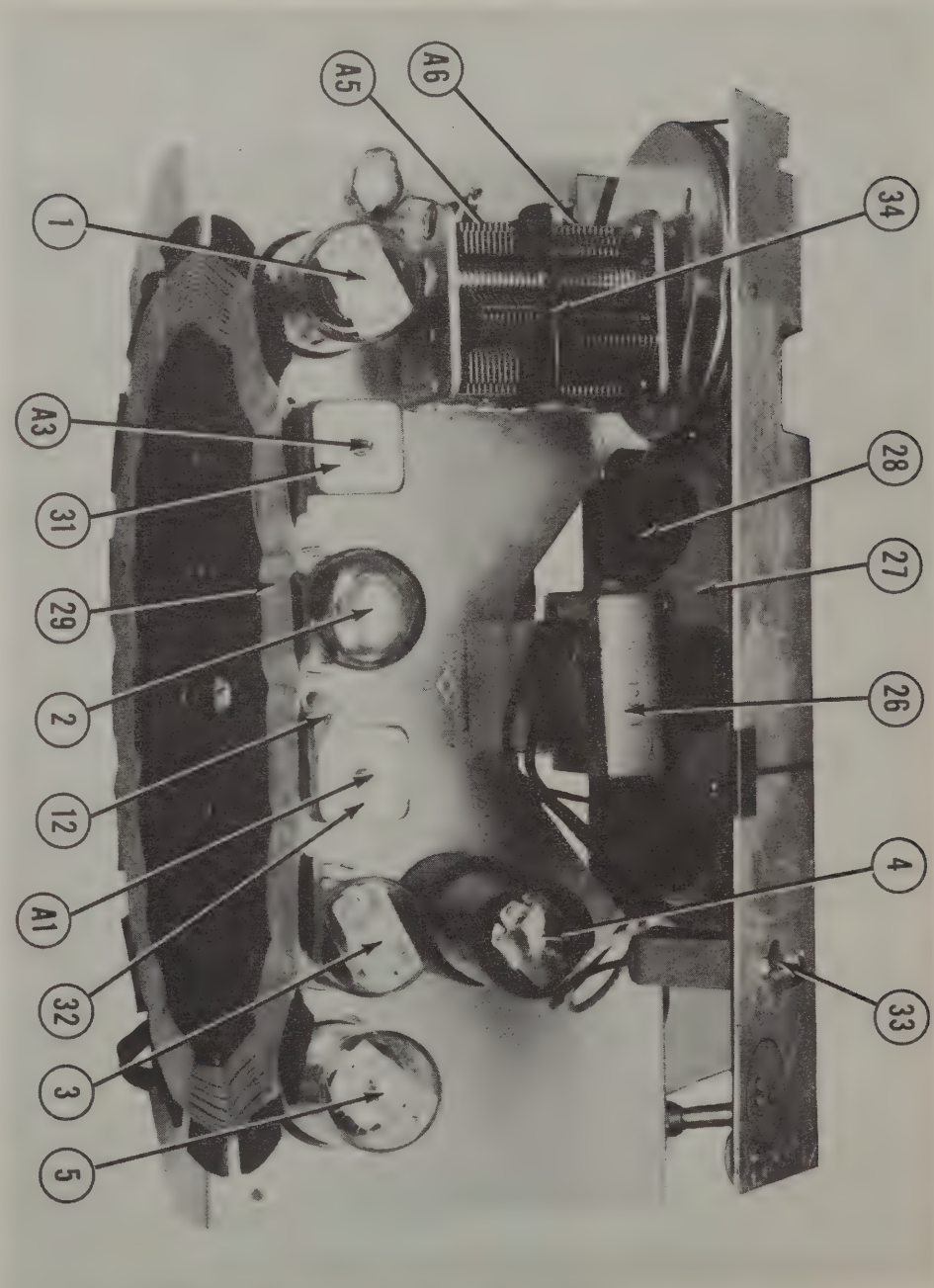
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	BELLTONE PART No.	IRC PART No.	
17	22KΩ	½		BTS-22K	Red-Red-Or. Oscillator Grid
18	2.2 Meg.	½		BTS-2.2 Meg	Red-Red-Grn. AVC Network
19	10 Meg.	½		BTS-10 Meg	Br.-Blk.-Blue 1st AF Series Grid
20	5 Meg.	½		BTS-4.7 Meg	Grn.-Blk.-Grn. 1st AF Grid Load
21	250KΩ	½		BTS-270K	Red-Grn.-Yl. 1st AF Plate Load
22	500KΩ	½		BTS-470K	Grn.-Blk.-Yl. Output Grid Load
23	270Ω	½		BW-½-270	Red-Vl.-Br. Output Cathode
24	270Ω	½		BW-2-270	Red-Vl.-Br. Output Cathode
25	2200Ω	2		BT-2-2200	Red-Red-Red Filter

TRANSFORMER (QUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		BELLTONE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
26	1950Ω	3.05Ω	175Ω	.52Ω		A-3876†	T22S45†		†Bend mounting tabs down, file out slots and mount on original bracket.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA BELLTONE PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-105		
27	PM	3.05Ω		Mod. P5-X		
	COIL DIA.	VC DIA.				
2o	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

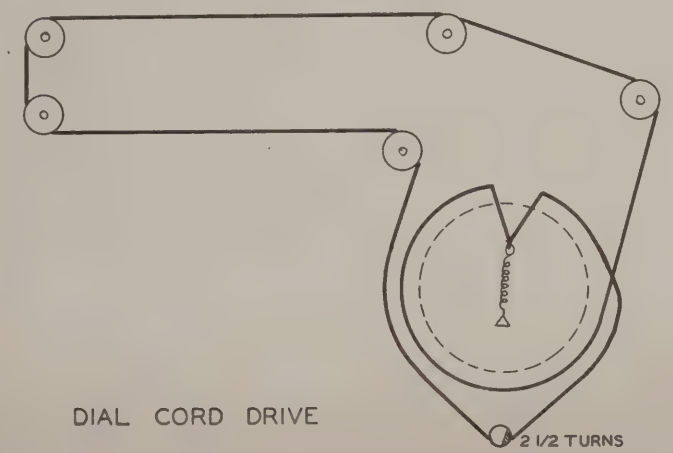
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA BELLTONE PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
29	Loop Ant.	0Ω	1.3Ω			
30	Osc. Coil		6Ω		14-1040	Add 50 MMFD cap. from grid to high side of tuning cap.
31	Input IF	10.5Ω	10.5Ω		16-6658	
32	Output IF	10.5Ω	10.5Ω		16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA BELLTONE PART No.		INSTALLATION NOTES
33	Bayonet	6-8	0.15	Brown			Type 47

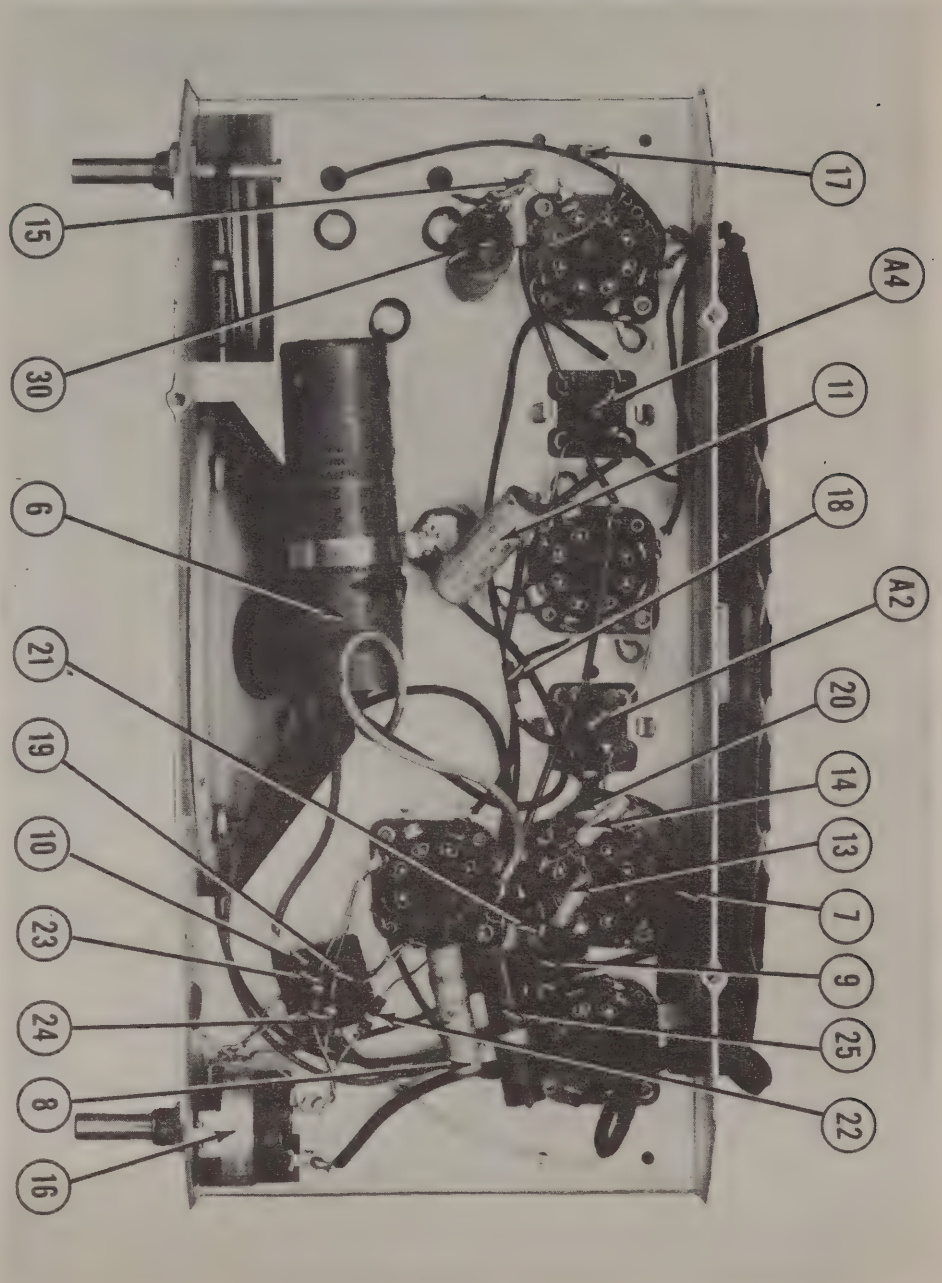
MISCELLANEOUS

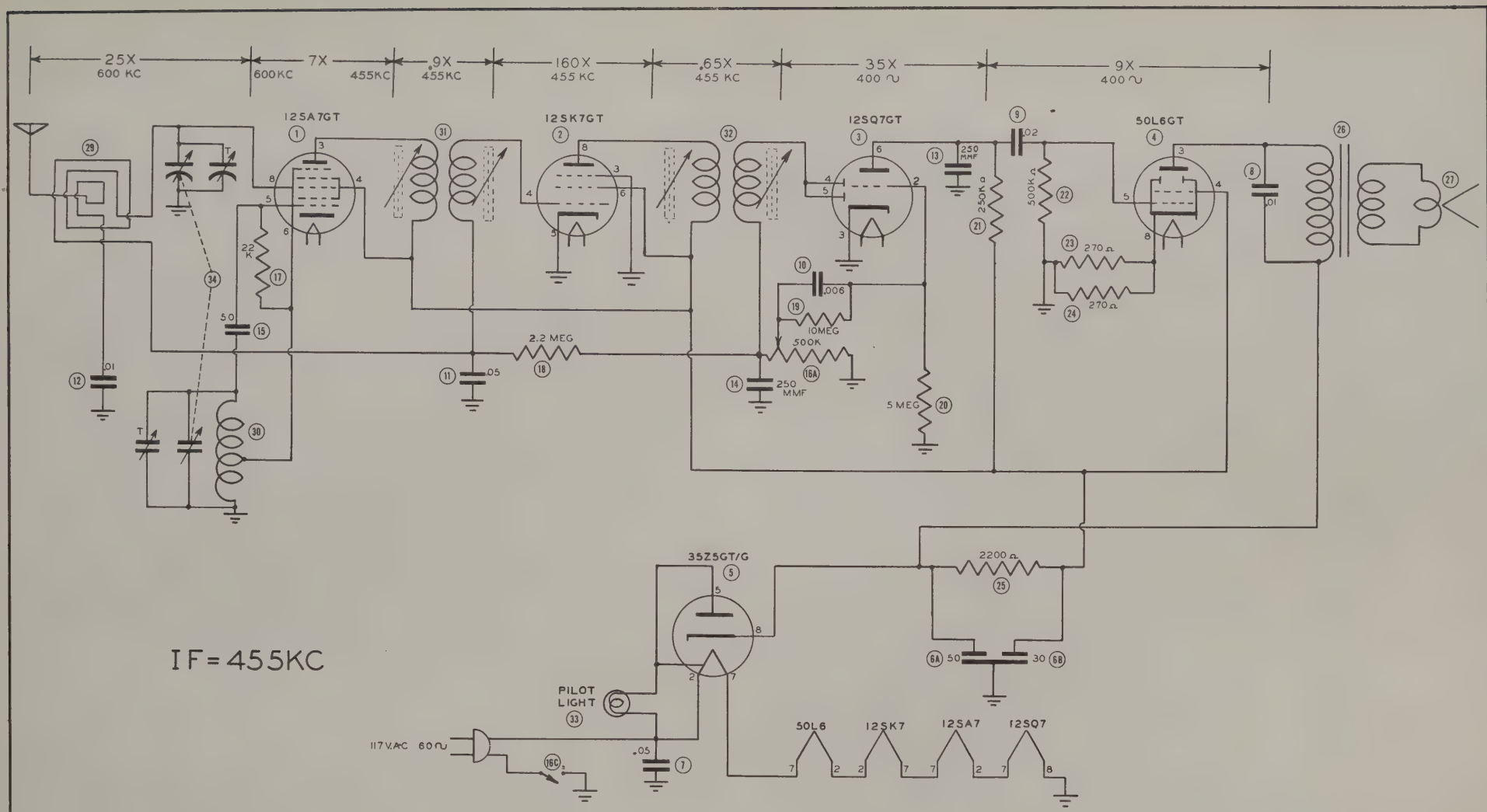
ITEM No.	PART NAME	BELLTONE PART No.	NOTES
34	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	15V. AC	75V. DC	75V. DC	-6.5V.DC	0V	27V.AC	-.2V. DC
2	12SK7GT	0V	39V. AC	0V	-.2V DC	0V	75V. DC	27V.AC	75V. DC
3	12SQ7GT	0V	-.55V. DC	0V	-.55VDC	-.55VDC	4.8V. DC	15V. AC	0V
4	50L6GT	0V	39V. AC	117V DC	75V DC	0V	-.55 V.DC	89V.AC	4.4 V.DC
5	35Z5GT	0V	117V. AC	113V. AC	0V	113V.AC	0V	89V.AC	122V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	15Ω	35KΩ	35KΩ	24KΩ	.75Ω	27Ω	2.7MEG
2	12SK7GT	0Ω	40Ω	0Ω	2.7 MEG	0Ω	35KΩ	27Ω	35KΩ
3	12SQ7GT	0Ω	3 MEG	0Ω	500KΩ	500KΩ	280KΩ	15Ω	0Ω
4	50L6GT	0Ω	40Ω	33KΩ	35KΩ	390KΩ	3 MEG	86Ω	130Ω
5	35Z5GT	0Ω	112Ω	109Ω	I N F	109Ω	I N F	86Ω	33KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-33

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

LINCOLN
MODEL 5A-110

LINCOLN
MODEL 5A-110

LINCOLN MODEL 5A-110

TRADE NAME	Lincoln Model 5A-110
SUPPLIER	Allied Radio Corp., 833 W. Jackson Blvd., Chicago, Ill.
TYPE SET	AC-DC Superheterodyne Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volts AC-DC RATING .235 Amps. @ 117V AC
TUNING RANGE—BROADCAST	550-1730KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator and B-. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of rear section of variable. Low side to B-.	455KC	High freq. end of dial. (Variable fully open.)	Across voice coil.	A1,A2, A3,A4.	Adjust for maximum output.
250 MMF	High side to ext. ant. (blue) lead. Low side to ground (black) lead.	1730KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		EIA BASE TYPE	INSTALLATION NOTES
		LINCOLN PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7GT	12SA7GT	8AD	
2	IF Amp.	12SK7GT	12SK7GT	8N	
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	LINCOLN PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
6A	50	150	25E1	FP214	DY-2x50-150	EL-25	AF1010D	UP6BJ34	▲ Filter
B	50	150							■ "
7	.05	400		TP426	S-4-05	TC-15	484-.05	DT4S5	Line Bypass
8	.01	400		TP421	S-4-01	TC-11	484-.01	DT4S1	Pwr. Amp. Plate Bypass
9	.01	400		TP421	S-4-01	TC-11	484-.01	DT4S1	Audio Coupling
10	.01	400		TP421	S-4-01	TC-11	484-.01	DT4S1	" "
11	.1	200		TP428	S-4-1	TC-1	484-.1	DT4P1	AVC Filter
12	100	500		MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	Audio Plate Bypass
13	100	500		MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	RF Bypass (Vol. Cont.)
14	100	500		MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	RF Bypass (Diode)
15	100	500		MC235	MO.5-31	1FM-31	1468-.0001	5W5T1	Osc. Grid Capacitor

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	LINCOLN PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	500KΩ	1	28E1	MK401	D13-133	AM-60-Z	See Installation Note 1
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instruction
C	Switch		" "	M26	41	SW-A	" " " " "

Note 1 - Wrap scotch tape around shaft to provide drive cord surface.

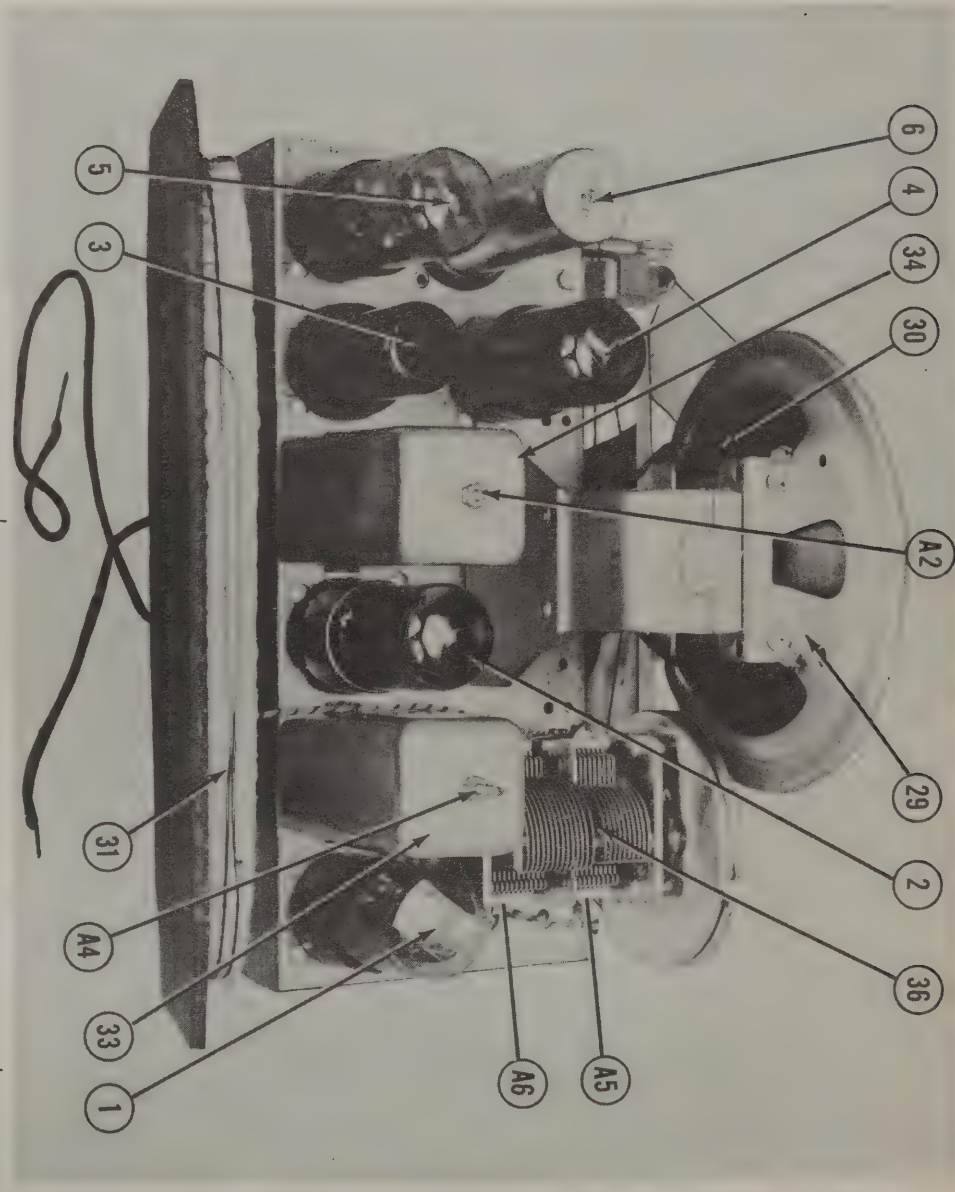
RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	LINCOLN PART No.	IRC PART No.	
17	22K	1/3		BTS-22K	Red-Red-Or. Osc. Grid
18	10 Meg.	1/4		BTS-10 Meg.	Br.-Blk.-Bl. AVC Network
19	3.3 Meg.	1/3		BTS-3.3 Meg.	Or.-Or.-Gr. AVC Network
20	68K	1/3		BTS-68K	Bl.-Gray-Or. IF Filter
21	3.3 Meg.	1/3		BTS-3.3 Meg.	Or.-Or.-Gr. 1st AF Grid
22	220K	1/4		BTS-220K	Red-Red-Yl. 1st AF Plate Load
23	470K	1/4		BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	1/4		BW-½-150Ω	Br.-Gr.-Br. Output Cathode
25	2200Ω	1		BTA-2200Ω	Red-Red-Red Filter
26	47Ω	1/2		BW-½-47Ω	Yl.-Vi.-Blk. Surge Limiter
27	100Ω	1/2		BW-½-100Ω	Br.-Blk.-Br. Pilot Light Shunt

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		LINCOLN PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
28	4970Ω	3.5Ω	237Ω	.98Ω	22E2	A-3877‡	T-13S39‡		‡Drill one new mounting hole.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA LINCOLN PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-106*		
29	PM	3.5Ω	1E9	Mod.-P5-W		*Fabricate new mounting bracket.
	CONE DIA.	VC DIA.				
30	4-5/8"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

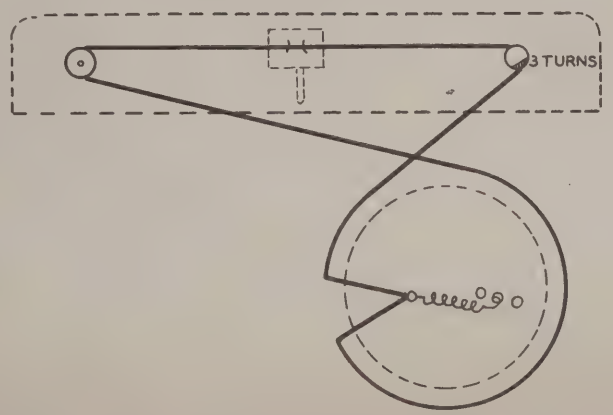
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA LINCOLN PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
31	Loop Ant.	0Ω	.5Ω			
32	Osc. Coil	.5Ω	8.5Ω	20E162	14-1040	
33	Input IF	11Ω	11Ω	20E21	16-5740	
34	Output IF	11Ω	10Ω	20E22	16-5742	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA LINCOLN PART No.		INSTALLATION NOTES
35	Bayonet	6-8	0.15	Brown			Type 47

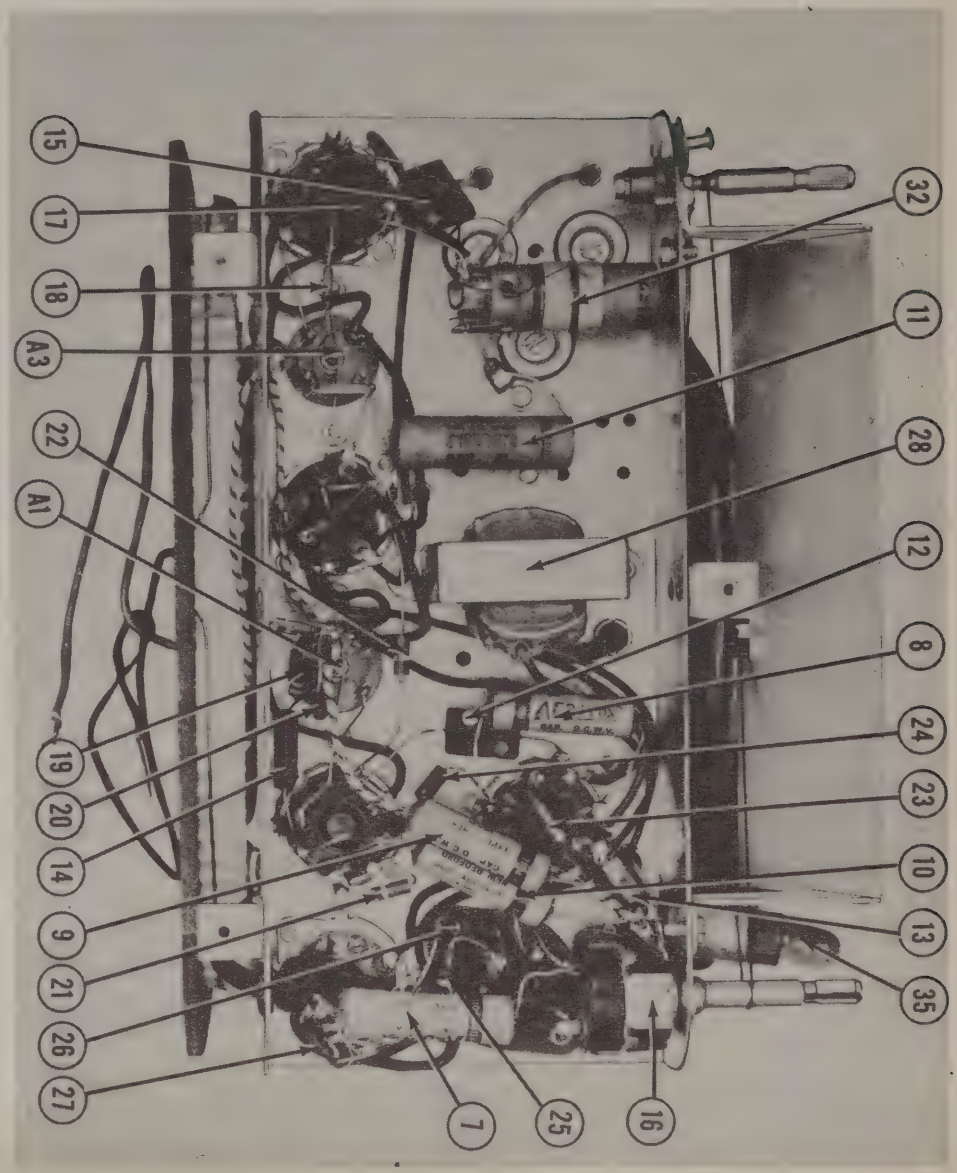
MISCELLANEOUS

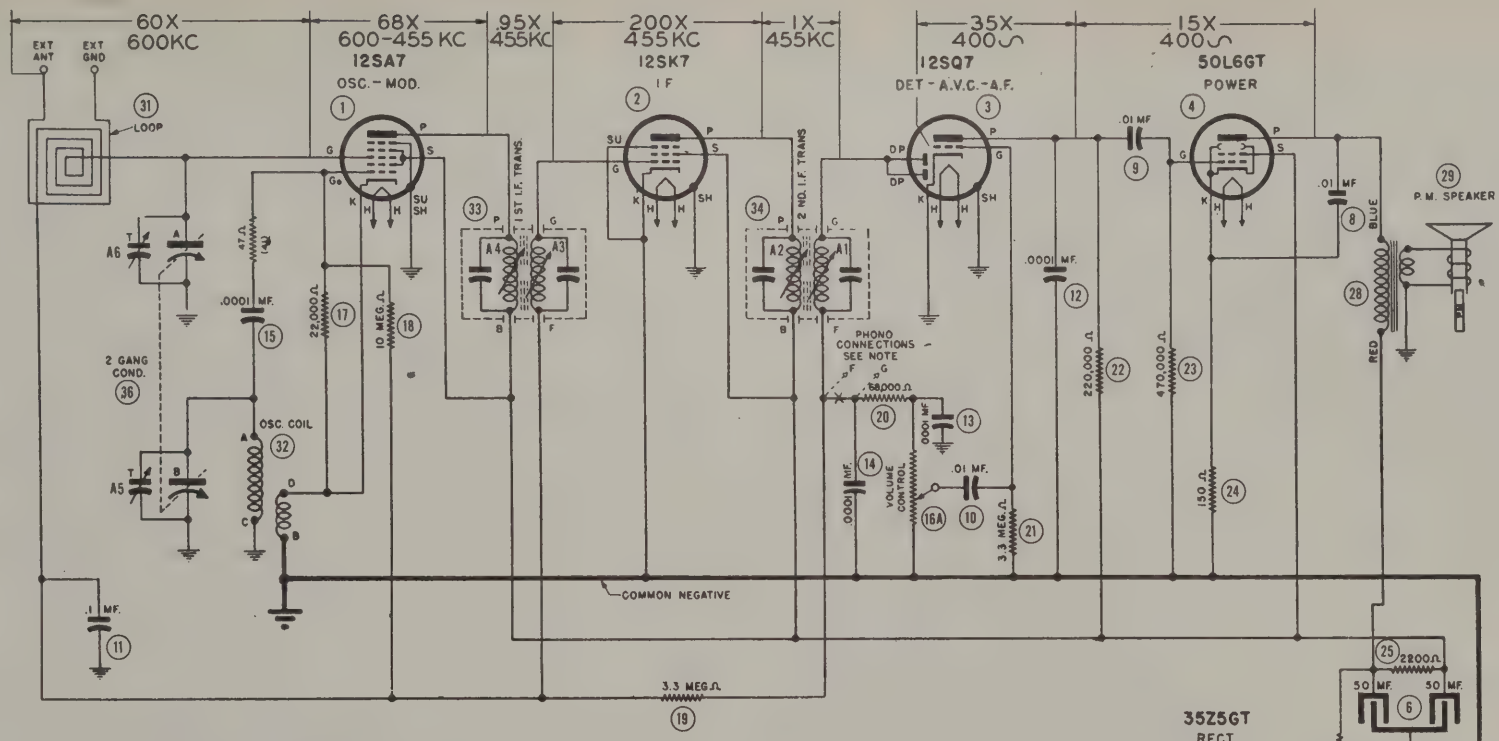
ITEM No.	PART NAME	LINCOLN PART No.	NOTES
36	Tuning Cap.		2 Gang Variable Cap.

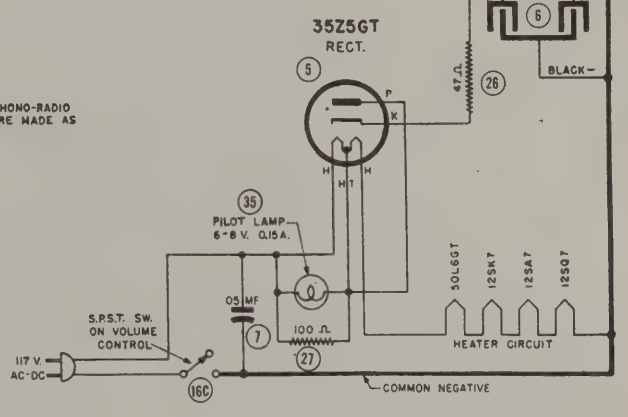


DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW







CIRCUIT IS BROKEN AT 'X' ON PHONO-RADIO MODELS AND CONNECTIONS ARE MADE AS SHOWN ON PHONO DIAGRAMS

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	12.5 V.AC	78V. DC	78V. DC	-6.9V.DC	0V	25.5V.AC	-.37V. DC
2	12SK7GT	0V	37.5 V.AC	0V	-.37V.DC	0V	78V. DC	25.5V.AC	78V. DC
3	12SQ7GT	0V	-.67V. DC	0V	-.77V.DC	-.77V.DC	48V. DC	12.5V.AC	0V
4	50L6GT	0V	37.5V.AC	112V. DC	78V.DC	0V	0V	87.5 VAC	4.9V. DC
5	35Z5GT	0V	117V. AC	113V. AC	0V	113V. AC	0V	87.5 VAC	122V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	14Ω	100 KΩ	100 KΩ	22K Ω	.5Ω	26Ω	3.1 MEG
2	12SK7GT	0Ω	39Ω	0Ω	3.1 MEG	0Ω	100 KΩ	26Ω	100KΩ
3	12SQ7GT	0Ω	4 MEG	0Ω	560KΩ	560KΩ	255KΩ	14Ω	0Ω
4	50L6GT	0Ω	39 Ω	100K Ω	100KΩ	520KΩ	I N F	80Ω	150Ω
5	35Z5GT	I N F	109Ω	105Ω	I N F	105Ω	I N F	80Ω	100KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

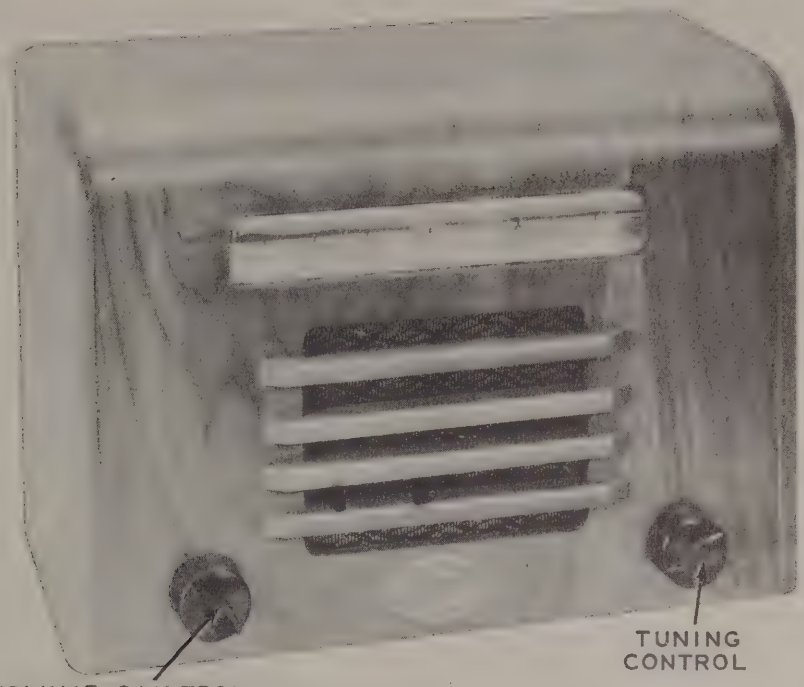
465-34

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

MAGIC-TONE
MODELS 500, 501



MAGIC-TONE
MODELS 500, 501

MAGIC-TONE MODELS 500,501

TRADE NAME	MAGIC-TONE MODELS 500, 501
MANUFACTURER	Radio Development & Research Corp., 26 Cornelison Ave., Jersey City 4, N.J.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 50L6GT Power Output, 35Z5GT Rectifier - or Metal Equivalents.
POWER SUPPLY	110 Volts AC-DC Rating .220 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1630KC

ALIGNMENT INSTRUCTIONS

A7 adjustment (padder) is not used on all sets. Volume control at maximum volume and output of signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to pin #4 (grid) 12SK7. Low side to chassis.	455KC	High freq. end of dial.	Across voice coil	A1,A2,	Adjust for maximum output. Use isolation transformer if available. If not, connect capacitor in series with low lead to chassis and decrease dummy ant. to prevent excessive hum modulation.
"	High side to pin #8 (grid) 12SA7. Low side to chassis.	"	"	"	A3,A4.	"
.0001MFD	High side to ant. lead. Low side to chassis.	1500KC	1500KC	"	A5,A6.	Adjust for maximum output.
"	"	600KC	Tune in 600KC signal.	"	A7	Rock dial and adjust for maximum output.
						Repeat adjustments A5 and A6 at 1500KC

This folder replaces #463-28 which covered the Magic-Tone Model 501.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: MAGIC-TONE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12SA7GT	12SA7GT	8AD	Metal equivalent may be used
2	IF Amp.	12SK7GT	12SK7GT	8N	" " " " "
3	Det.-AVC-AF	12SQ7GT	12SQ7GT	8Q	" " " " "
4	Power Output	50L6GT	50L6GT	7AC	
5	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: MAGIC-TONE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150	400-37	3N533	M-2x30-150	TA-230	PRSA150-40-30/25-20	EZ3215C	Filter - Yellow
B	20	150							" - Green
C	5	25			M-10-25	TA-5			Cath. Bypass-Red
6A	30	150		2N513	M-2x30-150	TA-230	PRSA150-40-40	EZ3315	Filter *
B	20	150							"
7	.1	400	400-34	TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
8A	.02	400	400-36	TP423	S-4-02	TC-12	484-02	DT4S2	50L6 Plate Bypass*
B	.01	400	400-35	TP421	S-4-01	TC-11	484-01	DT4S1	50L6 Plate Bypass
9	.01	400	400-35	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Coupling
10	.01	400	400-35	TP421	S-4-01	TC-11	484-01	DT4S1	" "
11	.1	400	400-33	TP428	S-4-1	TC-1	484-.1	DT4P1	AVC Filter
12	.01	400	400-35	TP421	S-4-01	TC-11	484-01	DT4S1	Ant. Coupling
13	250	500	400-39	MC240	M0.5-325	1FM-325	1468-00025	5W5T25	Audio Plate Bypass
14	250	500	400-39	MC240	M0.5-325	1FM-325	1468-00025	5W5T25	RF Bypass Diode
15	100	500	400-38	MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
35	5	25		TC-22	M-10-25	TA-5	PRS10-25	BR102A	Cath. Bypass *

*Used in early productions

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGIC-TONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500K	1	400-25	MR48	D13-133	M-60-Z	Volume Control
B	Shaft			Not Req.	A	Not Req.	Attach to 16A per instructions
C	Switch			M26	41	SW-A	" " " " "
16A	1 Meg.	1		MR53	D13-137	M-63-Z	Volume control-Note 1
B	Shaft			Not Req.	A	Not Req.	Attach to 16A per instructions
C	Switch			M26	41	SW-A	" " " " "

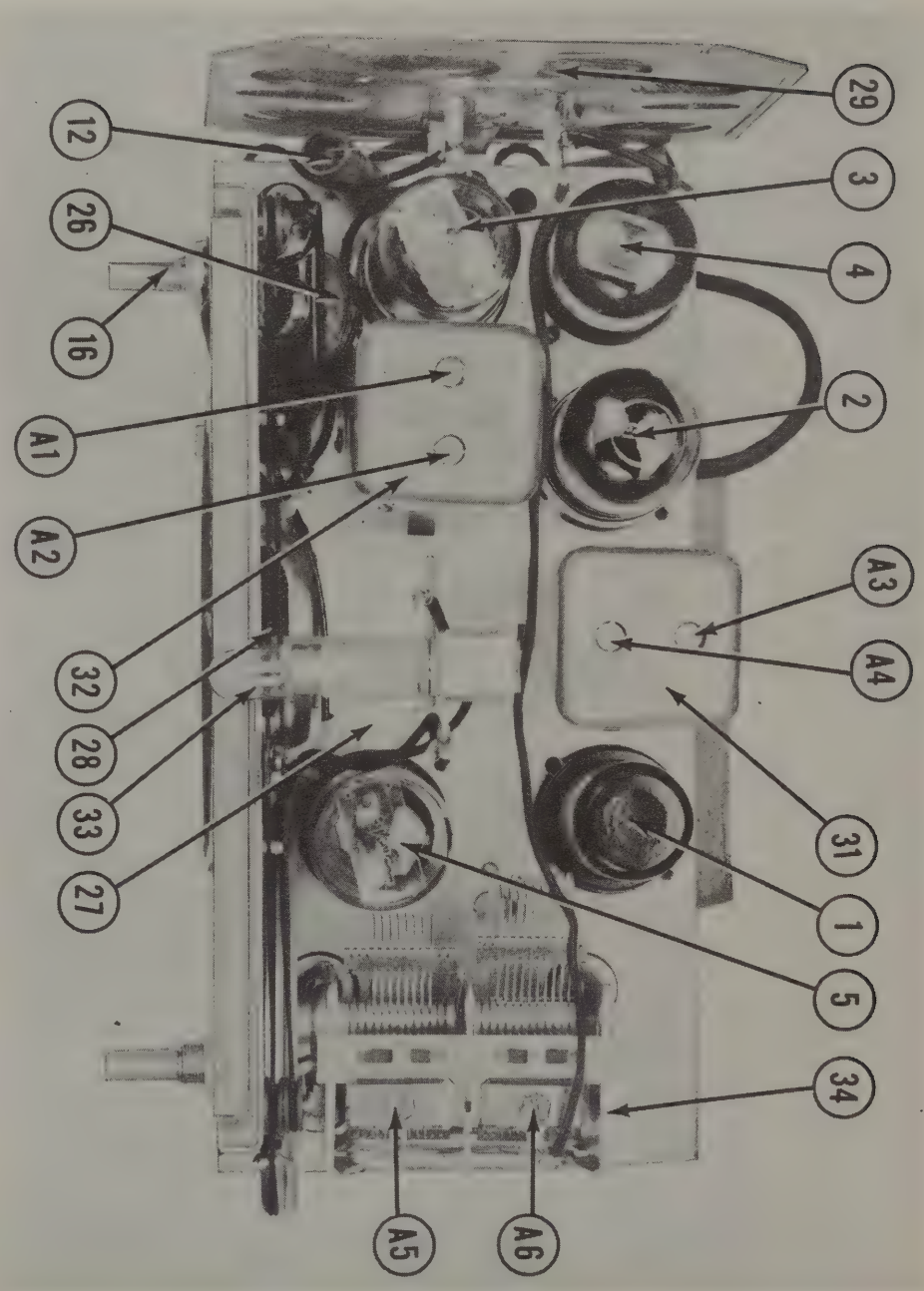
Note 1-Used in some models. Shunted by fixed resistor-Item 20

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: MAGIC-TONE PART No.	IRC PART No.	IDENTIFICATION CODES
17	15 Meg.	½	400-32	BTS-15 Meg.	Br.-Grn.-Blue AVC Network
18	20KΩ	½	400-28	BTS-22K	Red-Blk.-Or. Osc. Grid
19	1 Meg.	½	400-30	BTS-1 Meg.	Br.-Blk.-Grn. AVC Network
20	1 Meg.	½	400-30	BTS-1 Meg.	Br.-Blk.-Grn. Vol. Cont. Shunt #
21	6 Meg.	½	400-31	BTS-5.6 Meg.	Blue-Blk.-Grn. 1st AF Grid
22	470KΩ	½	400-29	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
23	470KΩ	½	400-29	BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	½	400-26	BW-½-150	Br.-Grn.-Br. Output Cathode
25	3000Ω	1	400-27	BTA-3000	Or.-Blk.-Red Filter

#Used only in models using one meg. volume control.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		MAGIC-TONE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
26A	16002	3.12	1302	.52	400-11	A-3876†	T-14862†		†Bend mounting tabs down, file out slots and mount on unused bracket on speaker.
B	40002	3.12				A-3877†	T-13539†		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			MAGIC-TONE PART No.	JENSEN PART No.		
	FIELD	VC IMP.				
27	PM	3.12	400-12	ST-113		
	CONE DIA.	VC DIA.				
28	4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

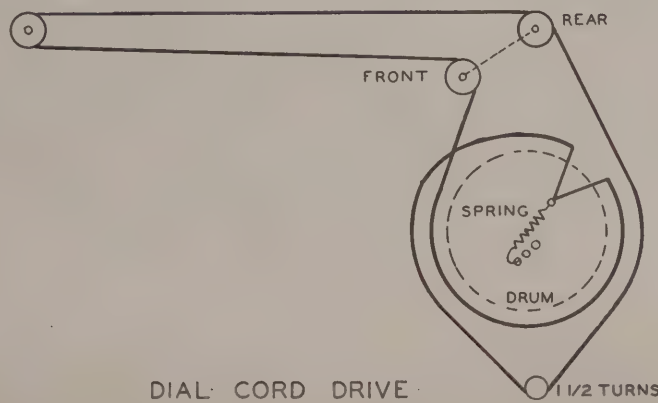
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	MAGIC-TONE PART No.	MEISSNER PART No.	
29	Loop Ant.	.12	1.42	400-13		
30	Osc. Coil		6.22	400-8	14-1040	
31	Input IF	14.12	14.12	1154	16-6658	
32	Output IF	14.12	14.32	1155	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					MAGIC-TONE PART No.		
33	Bayonet	6-8	0.15	Brown	400-23		Type 47

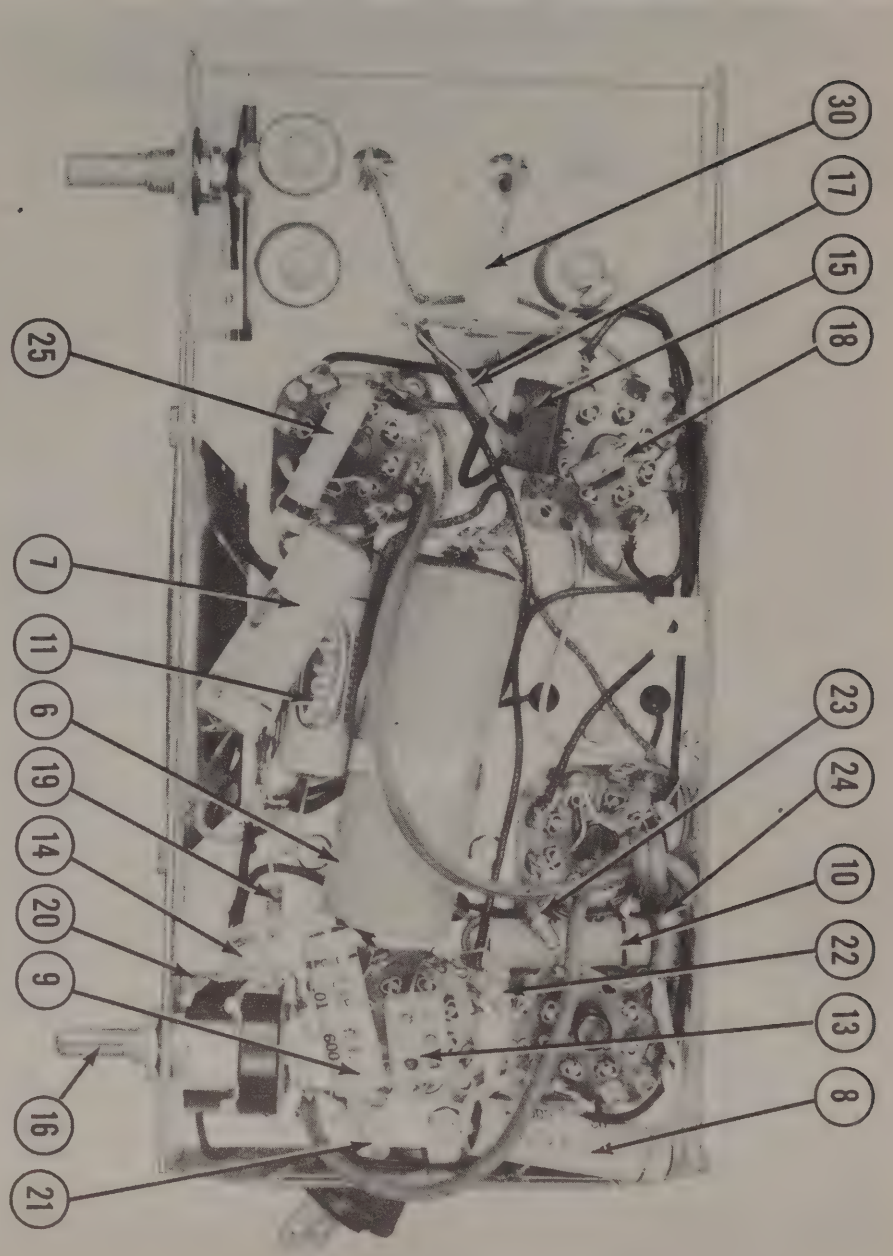
MISCELLANEOUS

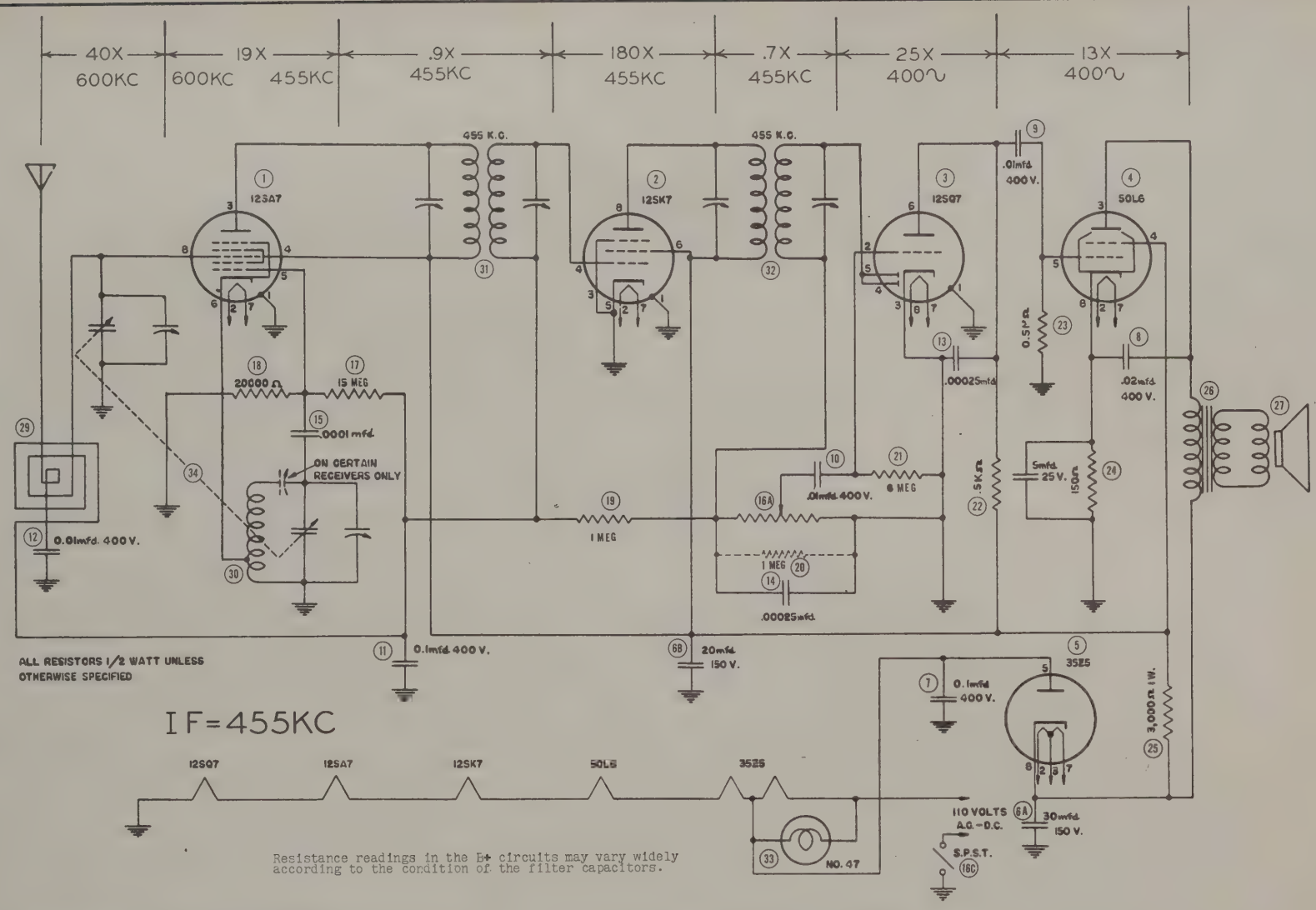
ITEM No.	PART NAME	MAGIC-TONE PART No.	NOTES
34	Tuning Cap.	400-8-500	2 Gang Variable Capacitor



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0V	13.2V. AC	67V. DC	67V. DC	-5V. DC	0V	26V. AC	-.15V. DC
2	12SK7GT	0V	26V. AC	0V	-.15V. DC	0V	67V. DC	38.6V.AC	67V. DC
3	12SQ7GT	0V	-.62V. DC	0V	-.67V. DC	-.67V. DC	35V. DC	13.2V.AC	0V
4	50L6GT	0V	38.6V.AC	120V. DC	67V. DC	0V	0V	89V. AC	3.9V. DC
5	35Z5GT	0V	117V. AC	112V. AC	67V. DC	112V. AC	0V	89V.AC	122V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7GT	0Ω	13Ω	143KΩ	143KΩ	18KΩ	.5Ω	25Ω	125MEG
2	12SK7GT	0Ω	25Ω	0Ω	1.25MEG	0Ω	143KΩ	36Ω	143KΩ
3	12SQ7GT	0Ω	6MEG	0Ω	480KΩ	480KΩ	613KΩ	13Ω	0Ω
4	50L6GT	INF	36Ω	140KΩ	143KΩ	510KΩ	INF	86Ω	135Ω
5	35Z5GT	INF	113Ω	110Ω	143KΩ	110Ω	INF	86Ω	140KΩ

465-40

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

SILVERTONE
MODEL 6002

SILVERTONE
MODEL 6002

SILVERTONE MODEL 6002

TRADE NAME	Silvertone Model 6002
MANUFACTURER	Sears, Roebuck & Co., 925 S. Homan St., Chicago, Ill.
TYPE SET	AC - DC Superheterodyne with Coiled Antenna Hank
TUBES (FOUR)	Types, 12SA7GT Converter, 12SQ7GT 2nd Det. 1st AF, 50L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING - .235 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.05 MFD.	High side to pin 8 of 12SA7. Low side to B-.	455KC	High freq. end of dial. (Variably fully open.)	Across voice coil.	A1,A2.	Adjust for maximum output.
50 MMF.	High side to ant. lead. Low side to B-.	1400KC	Tune for maximum output.	"	A3	Rock dial and adjust for maximum output.
"	"	600KC	"	"		Check sensitivity. If low, adjust antenna section plates for maximum output at 600KC.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA		RMA BASE TYPE	INSTALLATION NOTES
		SILVERTONE PART No.	STANDARD REPLACEMENT		
1	Converter	12SA7GT	12SA7GT	8R	
2	2nd Det. 1st AF	12SQ7GT	12SQ7GT	8Q	
3	Power Output	50L6GT	50L6GT	7AC	
4	Rectifier	35Z5GT	35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						IDENTIFICATION CODES AND INSTALLATION NOTES
	CAP.	VOLT	SILVERTONE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	
5A	40	150	N-19176	3N533	M-40-150	UT401	PRS150-40	E24215C	Filter - Red
B	20	150			M-20-150	UT201	PRS150-20		" - Blue
C	20	25			M-25-25	TA-25	PRS25-25		" - Green
6	.05	400		TP426	S-4-05	TC-15	484-.05	DT4S5	Line Bypass
7	.01	400		TP421	S-4-01	TC-11	484-.01	DT4S1	Pwr. Amp. Plate
8	.002	600		TP405	S-6-002	TC-22	684-.002	DT6D2	Audio Coupling
9	.05	400		TP426	S-4-05	TC-15	484-.05	DT4S5	Line Isolating
10	.05	200		TP426	S-4-05	TC-15	484-.05	DT4S5	AVC Filter
11	2000	500		MC457	MW.5-22	1FM-22	1467-.002	1W5D2	Audio Coupling
12	100	500		MC235	M0.5-31	1FM-31	1468-.0001	5W5T1	Audio Plate Bypass
13	100	500		MC235	M0.5-31	1FM-31	1468-.0001	5W5T1	RF Bypass Vol. Cont.
14	50	500		MC225	M0.5-45	1FM-45	1438-.00005	5W5Q5	Osc. Grid Cond.
15	40	500		MCB223	M0S.5-45	MS-44	1469-.00004	5R5Q4	RF Coupling

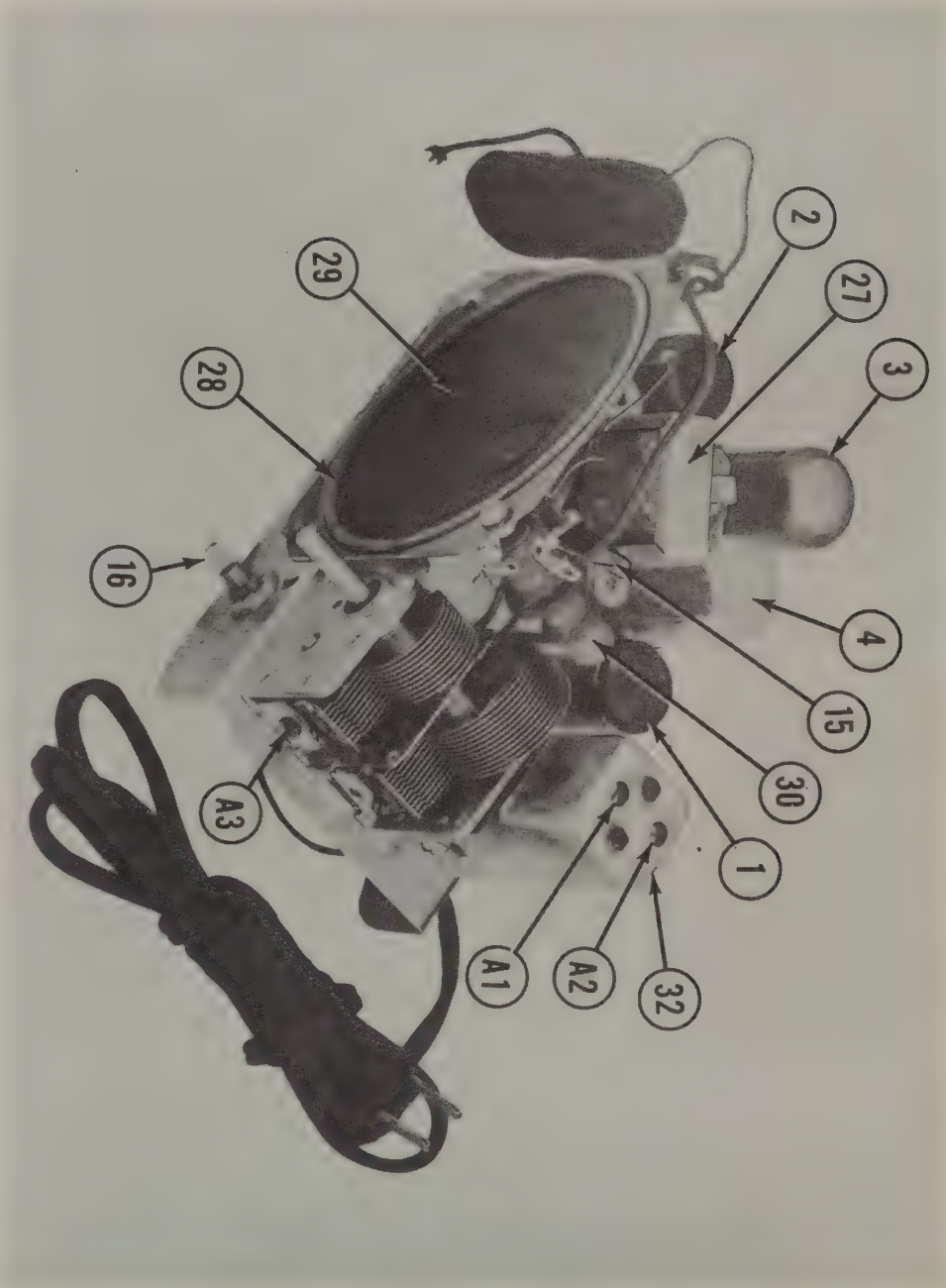
CONTROLS

ITEM No.	RATING		REPLACEMENT DATA				INSTALLATION NOTES
	RESISTANCE	WATTS	SILVERTONE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	
16A	2 Meg.	1	N18587	MR55	D13-139	M-65-Z	
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 16A per instructions.
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING		REPLACEMENT DATA		IDENTIFICATION CODES
	RESISTANCE	WATTS	SILVERTONE PART No.	IRC PART No.	
17	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
18	4.7 Meg.	½		BTS-4.7 Meg	Yl.-Vi.-Grn. AVC Network
19	15 Meg.	½		BTS-15 Meg.	Br.-Grn.-Blue 1st AF Grid
20	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Plate Load
21	1 Meg.	½		BTS-1 Meg.	Br.-Blk.-Grn. Output Grid
22	150Ω	½		BW-½-150Ω	Br.-Grn.-Br. Output Cathode
23	2200Ω	1		BTA-2200Ω	Red-Red-Red Screen Dropping
24	15Ω	½		BW-½-15Ω	Br.-Grn.-Blk. Filter
25	47Ω	1	N19177	BW-1-47Ω	Yl.-Vi.-Blk. Line Dropping
26	330KΩ	½		BTS-330K	Or.-Or.-Yl. Line Isolating

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		SILVERTONE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
27	19902	3.142	1622	.42	N18258	A3876	T13S42		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			SILVERTONE PART No.	JENSEN PART No.		
28	FIELD PM	VC IMP. 3.142	N17209	ST-113 Mod. P4-X		*Corner of speaker lip must cut to clear cabinet.
29	CONE DIA. 4"	VC DIA. ½"	Not replaceable - Use complete speaker unit.			

Note - Complete speaker and output transformer assembly may be obtained as part number N19937

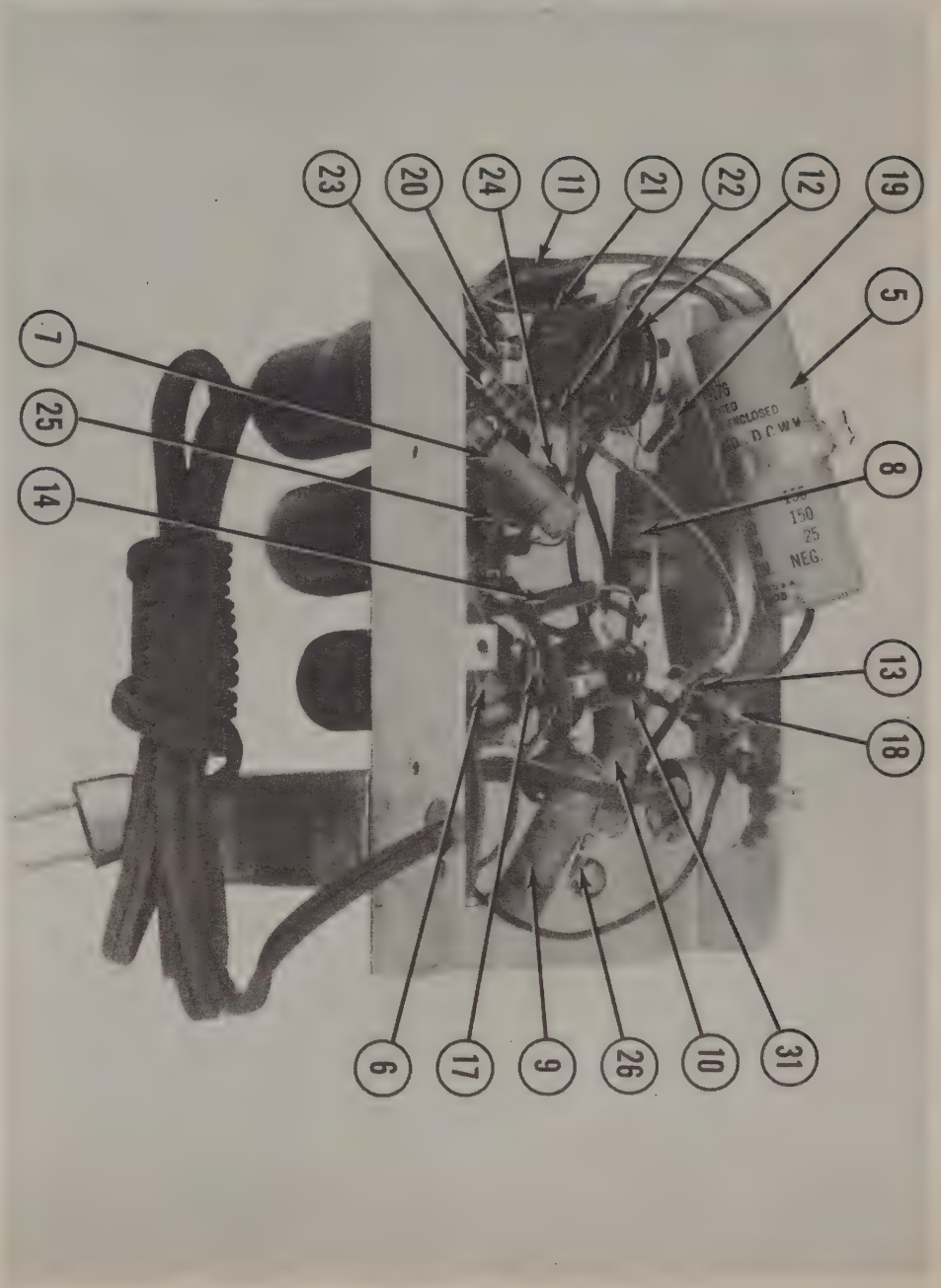
R F COILS

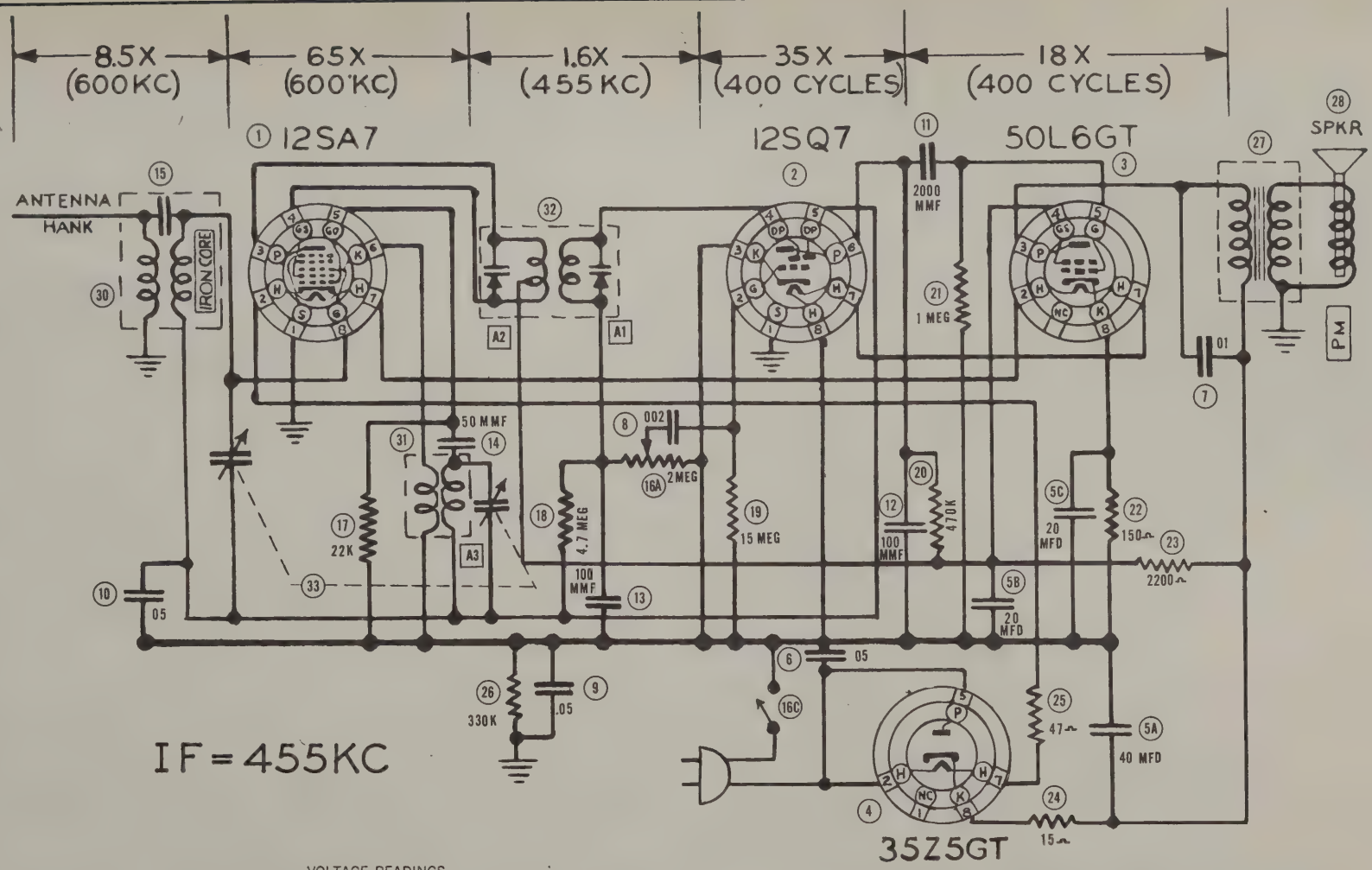
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	SILVERTONE PART No.	MEISSNER PART No.	
30	Ant.	322	32	N18255		
31	Osc.	.52	5.52	N18256		
32	IF	162	172	N19649		

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
33	Tuning Cap	N17115	2 Gang Variable Cap.
	Rear Cover Assby	N19212	Cabinet rear cover
	Dial Scale Emblem	N19122	
	Cabinet	N19936	Ivory
	Knob	N19120	Tuning, Ivory
	"	N18673	Volume, Ivory
	Antenna Wire	N19292	

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	0V	75V. AC	100V.DC	100V.DC	-5V. DC	0V	62V.AC	-.25V.DC
2	12SQ7	0V	-.6V. DC	0V	-.25V.DC	-.35V.DC	60V.DC	12V. AC	0V
3	50L6GT	0V	62V.AC	127V.DC	100V. DC	0V	0V	12V. AC	6.5V.DC
4	35Z5GT	0V	117V. AC	110V.AC	75V.AC	117 V.AC	130V.DC	82V.AC	130V.DC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SA7	340KΩ	65Ω	120KΩ	120KΩ	2.2KΩ	.5Ω	55Ω	6.5 MEG
2	12SQ7	340KΩ	15 MEG	0Ω	1.8 MEG	6.5 MEG	650KΩ	12Ω	0Ω
3	50L6GT	340KΩ	55Ω	120KΩ	120KΩ	1.1 MEG	0Ω	12Ω	125Ω
4	35Z5GT	340KΩ	150Ω	145Ω	63Ω	150Ω	122KΩ	120Ω	120KΩ

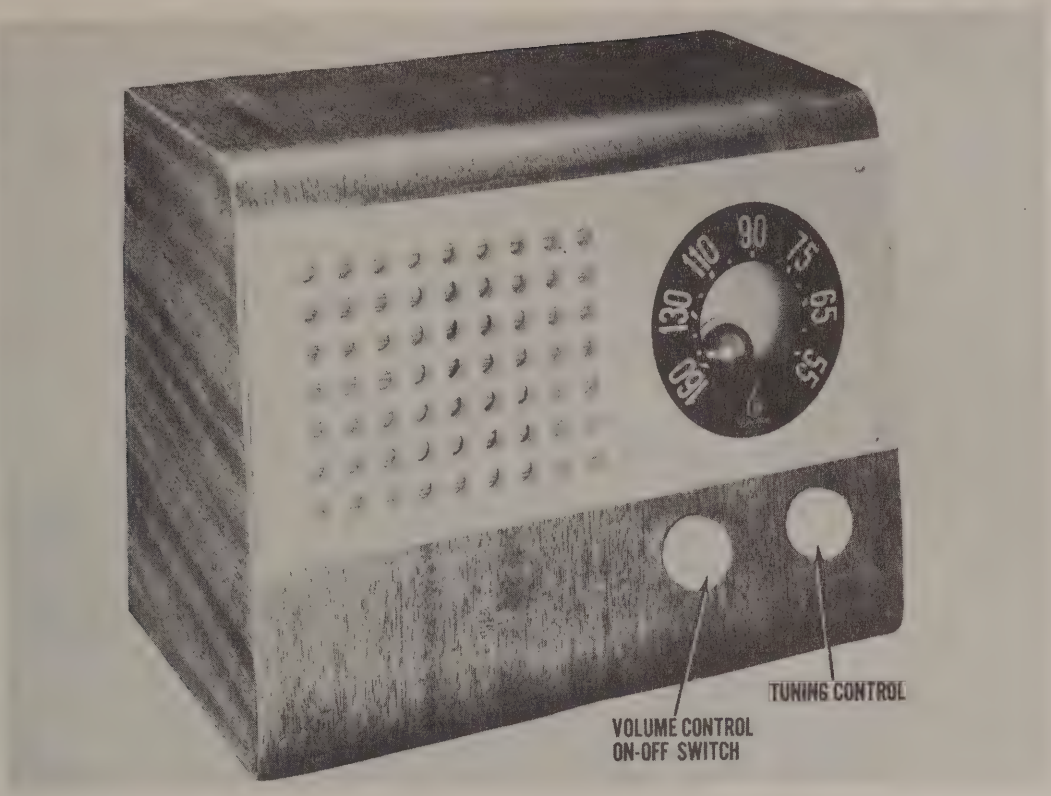
RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-35

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON
MODELS 510, 510A



EMERSON
MODELS 510, 510A

EMERSON MODELS 510, 510A

TRADE NAME	Emerson Models 510, 510A (Ch. No. 120000, 120029)
MANUFACTURER	Emerson Radio & Phono. Corp., 111 8th Ave., New York, N.Y.
TYPE SET	AC - DC Superheterodyne - Self Contained Loop Antenna
TUBES (FIVE)	Types, 12BE6 Converter, 12BA6 IF Amp., 12AT6 Det.-AVC-AF, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC RATING .235 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1620KC

ALIGNMENT INSTRUCTIONS

To set pointer, turn variable fully closed and set pointer horizontal. Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of rear section of variable. Low side to B-.	455KC	High freq. end of dial. (Variable fully open).	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
	Loop	1425KC	1425KC	Across voice coil	A5,A6.	Connect signal generator to three or four turns of wire wound in a circle 12" in diameter. Place 15"to 20" from and parallel to receiver loop. Adjust for maximum output in order given.
	"	600KC	Tune for maximum output.	"	32	Rock dial and adjust loose turn on loop for maximum output.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	12BE6	12BE6	7CH	
2	IF Amp.	12BA6	12BA6	7BK	
3	Det.-AVC-AF	12AT6	12AT6	7BT	
4	Power Output	50B5	50B5	7BZ	
5	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150	925000	2N520	M-50+30-150	TA-530	PRSA150-40-40	BRD3515	Filter - Red
B	50	150							" - Green
7	.05	400	920030	TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
8	.2	200	920050	TP429	S-4-2	TC-2	484-.2	DT4P2	Line Isolating
9	.02	400	920020	TP423	S-4-02	TC-12	484-02	DT4S2	50B5 Plate Bypass
10	.02	400	920020	TP423	S-4-02	TC-12	484-02	DT4S2	Audio Coupling
11	.001	600	920170	TP404	S-6-001	TC-21	684-001	DT6D1	Audio Plate Bypass
12	.002	600	920010	TP405	S-6-002	TC-22	684-002	DT6D1	Audio Coupling
13	.1	200	920040	TP428	S-4-1	TC-1	484-.1	DT4P1	AVC Filter
14	.002	600	920010	TP405	S-6-002	TC-22	684-002	DT6D2	Ant. Coupling*
15	220	500	910000	MC237	M0.5-32	1FM-32	1468-0002	5W5T2	IF Bypass Vol. Cont.*

*Not used in all models.

CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
16A	500KΩ	1	390010	MK401	D13-133	AM-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 16A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

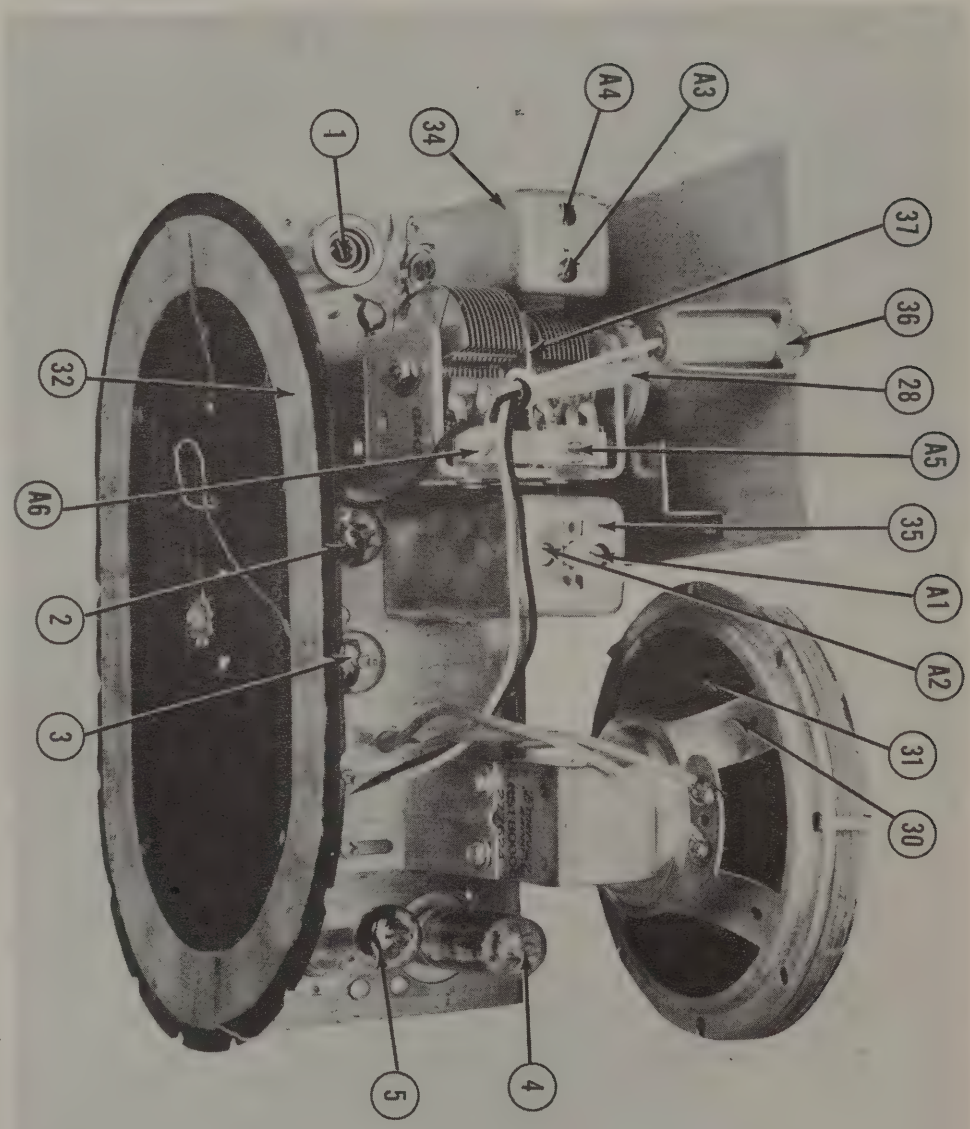
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: IRC PART No.	IDENTIFICATION CODES
17	22KΩ	½	310810	BTS-22K	Red-Red-Or. Osc. Grid
18	15 Meg.	½	397000	BTS-15 Meg.	Br.-Grn.-Blue AVC Network
19	2.2 Meg.	½	321330	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
20	15 Meg.	½	397000	BTS-15 Meg.	Br.-Grn.-Blue 1st AF Grid
21	470KΩ	½	321130	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
22	470KΩ	½	321130	BTS-470K	Yl.-Vi.-Yl. Output Grid
23	150Ω	½	340290	BW-½-150	Br.-Grn.-Br. Output Cathode
24	1000Ω	1	370490	BTA-1000	Br.-Blk.-Red Filter
25	220KΩ	½	321050	BTS-220K	Red-Red-Yl. Line Isolating
26	120Ω	1		BW-1-120	Br.-Red-Br. IF Cathode*
27	15Ω	1	397040	BW-1-15	Br.-Grn.-Blk. Rectifier Ballast
28	10Ω	½	340010	BW-½-10	Br.-Blk.-Blk. Series Pilot Light

*Not used in all models

TRANSFORMER (OUTPUT)

ITEM No.	RATING: IMPEDANCE PRI.	RATING: IMPEDANCE SEC.	RATING: DC RES. PRI.	RATING: DC RES. SEC.	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANCOR PART No.	REPLACEMENT DATA: THORDAR'N PART No.		INSTALLATION NOTES
29	2010Ω	3.2Ω	224Ω tapped @ 92	.85Ω	734000	A-3876†	T-14S82†		†Drill one new mounting hole. Add extra filter if necessary to reduce hum level.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA EMERSON PART No.	JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.		ST-107‡		
30	FM	3.2Ω	180000	Mod. P5-V		‡Fabricate new mounting bracket.
	CONE DIA.	VC DIA.				
31	4-5/8"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

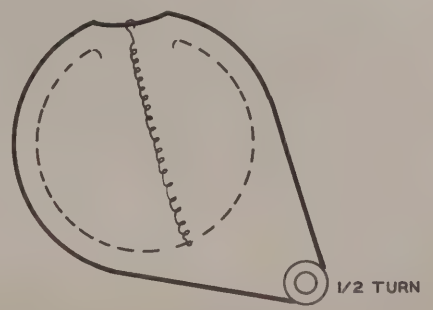
ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA EMERSON PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
32	Loop Ant.		1.8Ω	700000		Some models use Part No. 700200
33	Osc. Coil	.5Ω	5.5Ω	716010	14-1040#	#Add 50 MMFD cap. from grid to high side tuning cap.
34	Input IF	28Ω	18Ω	720000	16-6666	
35	Output IF	23Ω	22Ω	720100	16-6660	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA EMERSON PART No.		INSTALLATION NOTES
36	Bayonet	6-8	0.15	Brown	807000		Type 47

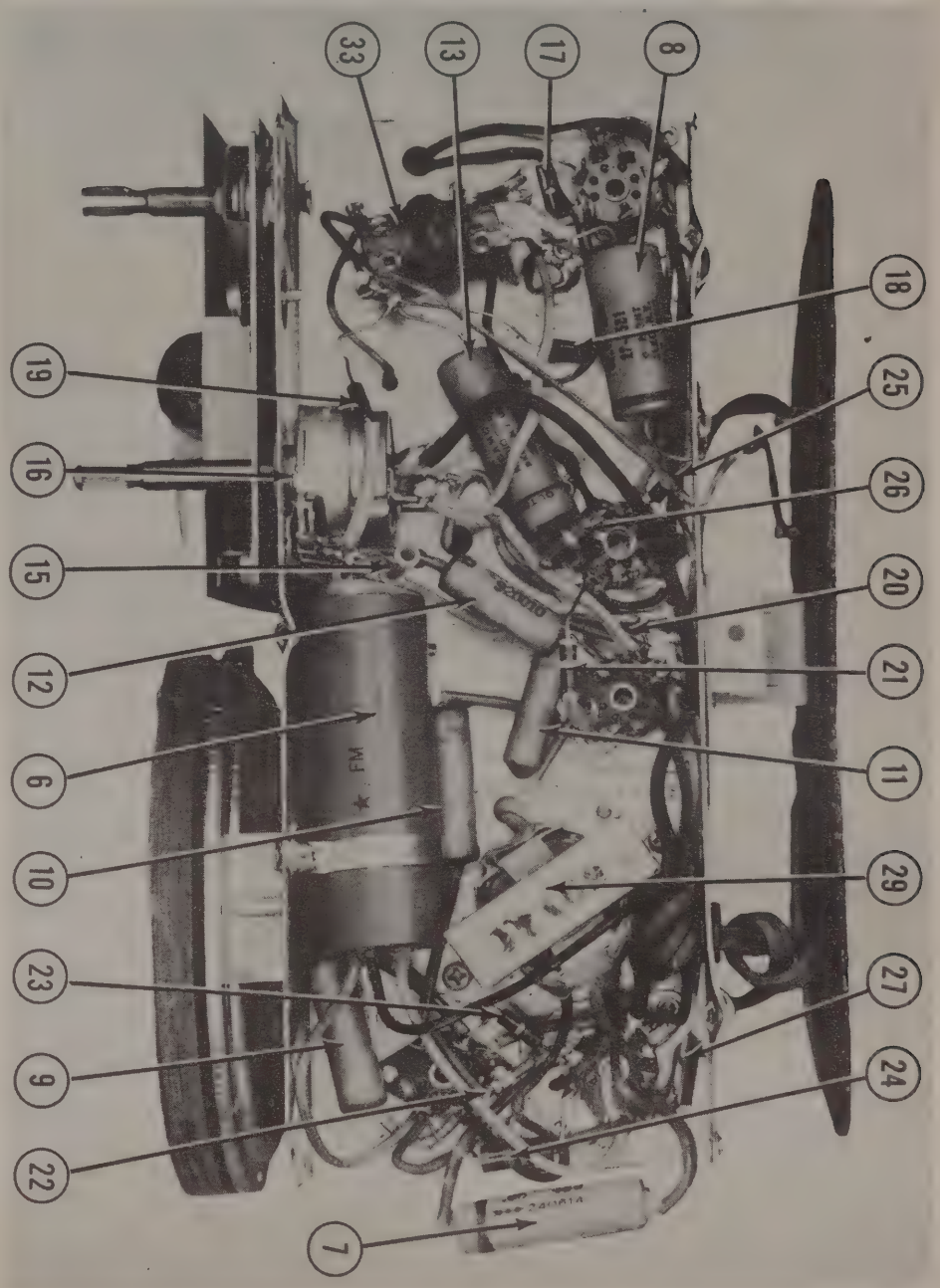
MISCELLANEOUS

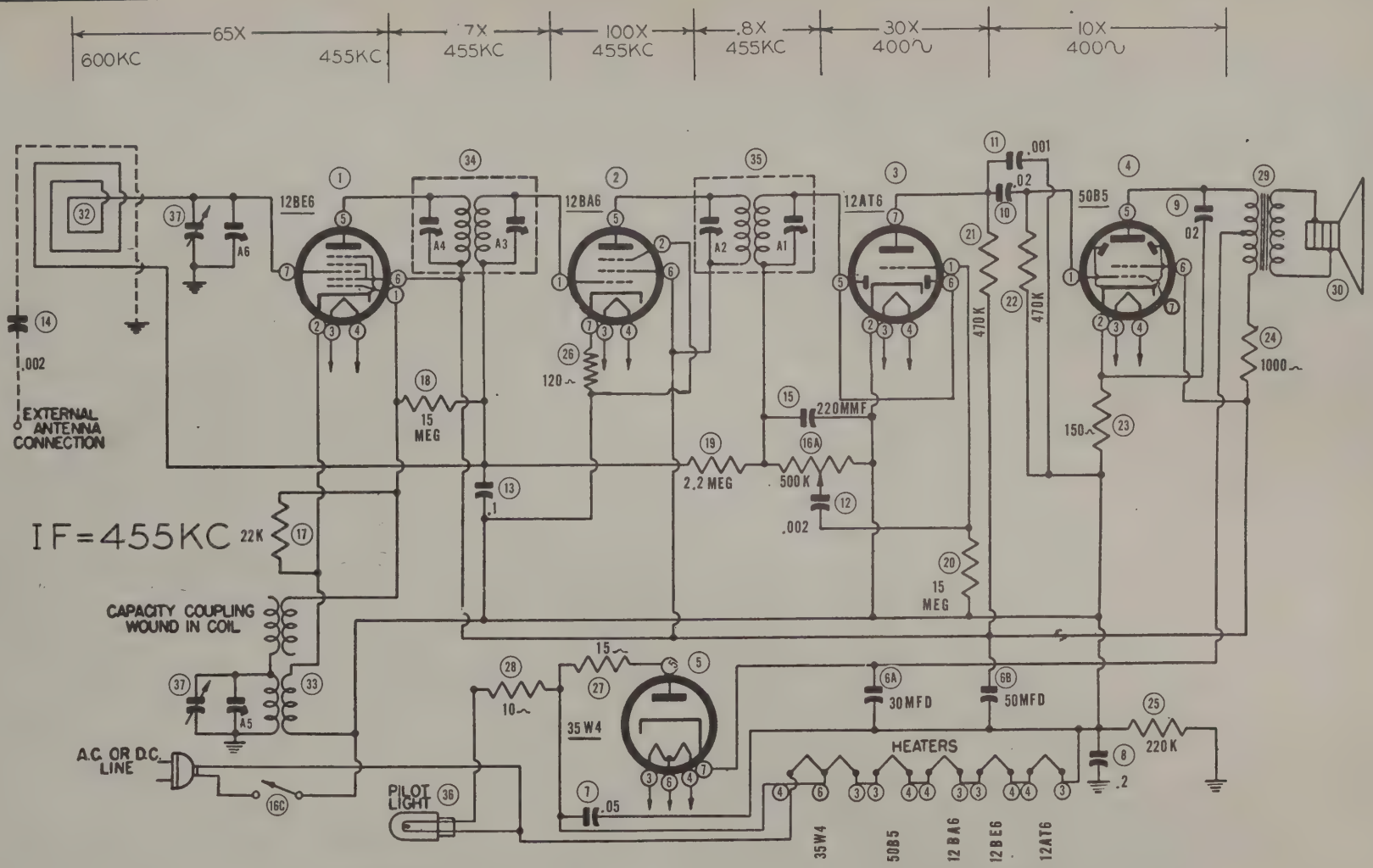
ITEM No.	PART NAME	EMERSON PART No.	NOTES
37A	Tuning Cap.	900170	Chassis 120000
37B	" "	900290	" 120029
37C	" "	900160	" 120029
	Cabinet	140005	Walnut
	"	140006	Mahogany
	Front	450330	Black Plastic
	Knob	460470	
	Dial Pointer	525010	Assembly
	Dial Crystal	520080	



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	-6.8V. DC	0V	24.5VAC	12V. AC	93V.DC	93V.DC	-.2V. DC
2	12BA6	-.2V. DC	0V	24.5VAC	36V.AC	93V.DC	93V.DC	0V
3	12AT6	-5V. DC	0V	0V	12V. AC	-.55V.DC	-.55V.DC	44V.DC
4	50B5	0V	6.2V.DC	87V. AC	36V. AC	107V.DC	93V. DC	0V
5	35W4	113V. DC	0V	87V. AC	117V. AC	112V. AC	113V. AC	113V. DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	12BE6	24K Ω	.75Ω	25 Ω	12.5 Ω	66K Ω	66K Ω	2.4MEG
2	12BA6	2.4 MEG	0Ω	25 Ω	38Ω	66KΩ	66KΩ	0Ω
3	12AT6	20 MEG	0Ω	0Ω	12.5Ω	590KΩ	590KΩ	530KΩ
4	50B5	500KΩ	155 Ω	89Ω	38Ω	65KΩ	66KΩ	500KΩ
5	35W4	66KΩ	0Ω	89Ω	121Ω	132 Ω	119Ω	65KΩ

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

465-36

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

EMERSON
MODEL 523

EMERSON
MODEL 523

EMERSON MODEL 523

TRADE NAME	Emerson Model 523
MANUFACTURER	Emerson Radio & Phono. Corp., 111 8th Ave., New York, N.Y.
TYPE SET	Three Power Portable AC-DC Battery - Superheterodyne Self Contained Loop Antenna
TUBES (SEVEN)	Types, 1T4 RF Amp., 1R5 Converter, 1T4 IF Amp., 1S5 Det.-AVC-AF, 3Q4 Power Output, 50B5 Power Output, 35W4 Rectifier.
POWER SUPPLY	105-125 Volts AC-DC or 2-4½ Volt "A" Batteries: 2-45 Volt "B" Batteries
TUNING RANGE—BROADCAST	540-1620KC RATING - .240 Amps. @ 117V AC - 50 MA @ 9V DC & 17MA @ 90V DC

ALIGNMENT INSTRUCTIONS

When aligning receiver on AC-DC operation use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to chassis. Volume control at maximum volume position and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD.	High side to stator of front section of variable. Low side to chassis.	262KC	High freq.end of dial.(Variable fully open)	Across voice coil	A1,A2, A3,	Adjust for maximum output.
200 MMF.	High side to stator of rear section of variable. Low side to chassis.	1425KC	1425KC	"	A4,A5.	Adjust for maximum output in order given.
"	"	600KC	Tune for maximum output.	"	A6	Rock dial and adjust for maximum output.
	Loop	1425KC	"	"	A7	Connect signal generator to a coil of three or four turns of wire wound 12" in diameter. Place coil parallel to and in line with the receiver loop at distance of 15 to 20 inches. Adjust for maximum output.
	"	600KC	"	"	48	Adjust loose outside turn of the loop ant. for maximum output. Recheck A4, A5 and A6 at 1425KC.

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: EMERSON PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.	1T4	1T4	6AR	
2	Converter	1R5	1R5	7AT	
3	IF Amp.	1T4	1T4	6AR	
4	Det.-AVC-AF	1S5	1S5	6AU	
5	Power Output	3Q4	3Q4	7BA	
6	Power Output	50B5	50B5	7BZ	
7	Rectifier	35W4	35W4	5BQ	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: EMERSON PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
8A	20	150	925210	FP304	DY-40+20-150/	EL-351	AF88D	UP4215	▲ Filter
B	40	150			100-25				■ "
C	100	25					PRS25-100	BRH251	Cath. Bypass
9	.05	400	920030	TP426	S-4-05	TC-15	484-05	DT4S5	Line Filter
10	.25	100	920110	TP430	S-4-25	TC-2	484-.25	DT4P25	Filament Bypass
11	.02	200	920100	TP423	S-4-02	TC-12	484-02	DT4S2	" "
12	.01	400	920090	TP421	S-4-01	TC-11	484-01	DT4S1	50B5 Plate Bypass
13	.02	200	920100	TP423	S-4-02	TC-12	484-02	DT4S2	Audio Coupling
14	.01	400	920090	TP421	S-4-01	TC-11	484-01	DT4S1	Audio Screen Bypass
15	.002	600	920010	TP405	S-6-002	TC-22	684-002	DT6D2	Audio Coupling
16	.05	200	920060	TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
17	.02	200	920100	TP423	S-4-02	TC-12	484-02	DT4S2	" "
18	.02	400	920020	TP423	S-4-02	TC-12	484-02	DT4S2	Plate Bypass
19	.02	200	920100	TP423	S-4-02	TC-12	484-02	DT4S2	Screen Bypass
20	.02	400	920020	TP423	S-4-02	TC-12	484-02	DT4S2	Ant. Coupling
21	400	500	910050	MC243	M0.5-34	1FM-34	1468-0004	5W5T4	Audio Plate Bypass
22	110	500	910010	MC235	M0.5-31	1FM-31	1468-0001	5W5T1	IF Bypass Vol. Cont.

CONTROLS

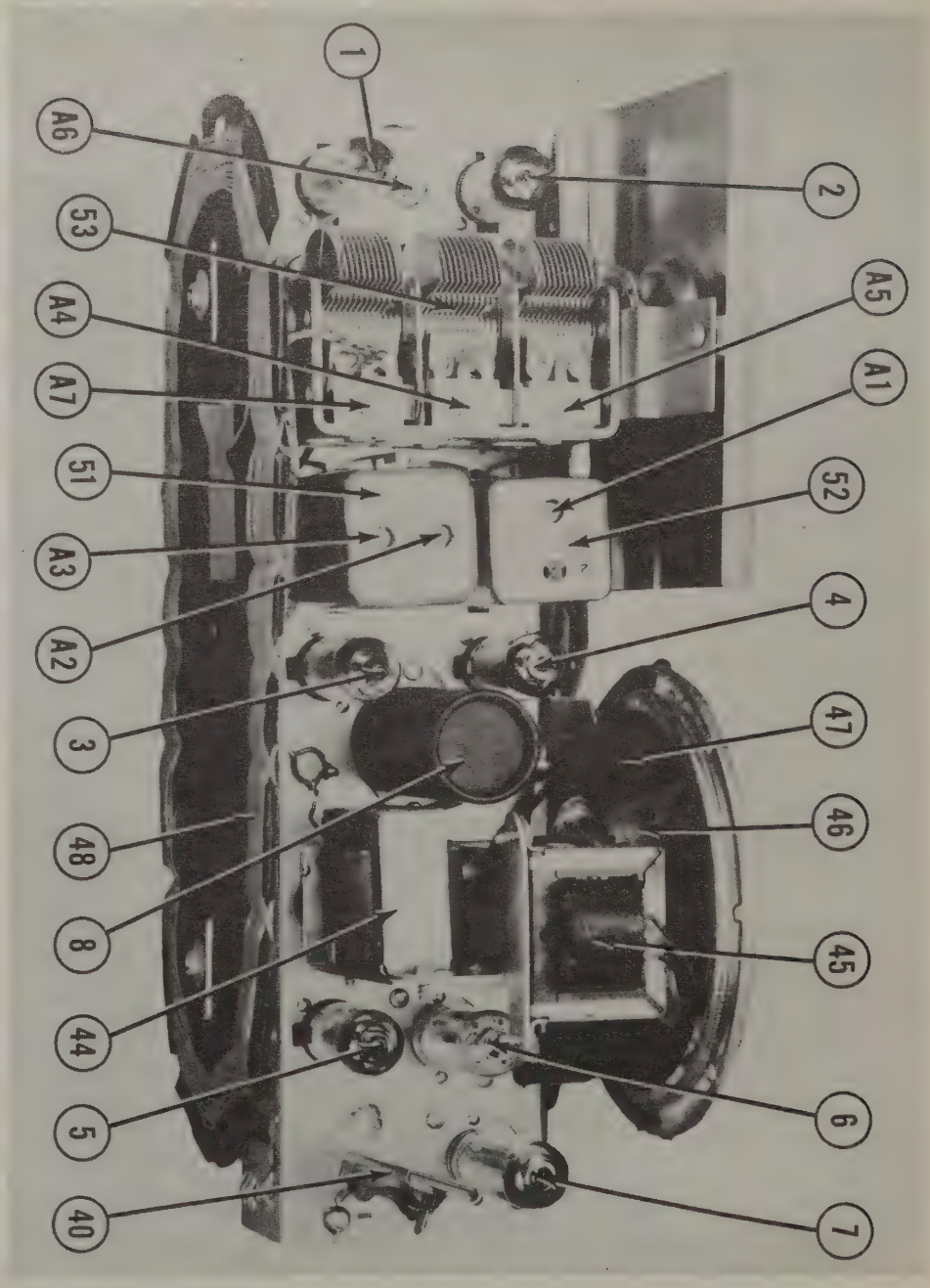
ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
23A	500KΩ	1	390020	MK401	D13-133	AM-60-2	Volume Control
B	Shaft		Not Req.	Not Req.	E	KSS-3	Attach to 23A per instructions
C	Switch		" "	M27	42	SW-A2	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: EMERSON PART No.	IRC PART No.	IDENTIFICATION CODES
24	3.3 Meg.	¼	311330	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
25	100KΩ	¼	310970	BTS-100K	Br.-Blk.-Yl. Osc. Grid
26	680Ω	¼	310450	BTS-680	Blue-Gray-Br. Filament String
27	3.3 Meg.	¼	311330	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
28	3.3 Meg.	¼	311330	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
29	2.2 Meg.	¼	321290	BTS-2.2 Meg.	Red-Red-Grn. AVC Network
30	3.3 Meg.	¼	311330	BTS-3.3 Meg.	Or.-Or.-Grn. AVC Network
31	3.3 Meg.	¼	311330	BTS-3.3 Meg.	Or.-Or.-Grn. 1st AF Screen Dropping
32	470KΩ	¼	321130	BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
33	1.5 Meg.	¼		BTS-1.5 Meg.	Br.-Grn.-Grn. Feedback
34	10 Meg.	¼	321450	BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
35	5.6 Meg.	¼	311390	BTS-5.6 Meg.	Grn.-Blue-Grn. Bias - See Note 1
36	470KΩ	¼	321130	BTS-470K	Yl.-Vi.-Yl. Output Grid
37	10KΩ	¼		BTS-10K	Br.-Blk.-Or. Output Cathode
38	33Ω	¼	310130	BW-½-33	Or.-Or.-Blk. Bias
39	2200Ω	¼	310570	BTS-2200	Red-Red-Red Filament String
40	240Ω	10		AB-250	Line Dropping - See Note 1
41	3900Ω	½	340630	BTS-3900	Or.-White-Red Plate Dropping
42	15KΩ	½	340770	BTS-15K	Br.-Grn.-Or. Screen Dropping
43	1600Ω	½		BTS-1500	Br.-Blue-Red Filament String - See Note 1

Note 1 - Not used in all models.

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

FILTER CHOKE

ITEM NO.	RATINGS			REPLACEMENT DATA			INSTALLATION NOTES
	TOTAL DIRECT CURRENT	D. C. RESISTANCE	INDUCTANCE (0 CURRENT 1000)	EMERSON PART NO.	STANCOR PART NO.	THORDARSON PART NO.	
44	55MA	500Ω	8 Henries	737010	C-1215*	T-14C64	* Drill new mounting holes.

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		EMERSON PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
45	9000Ω tapped @2400Ω	3.3Ω	342Ω tapped @ 166Ω	.5Ω	734040		T-22547		

SPEAKER

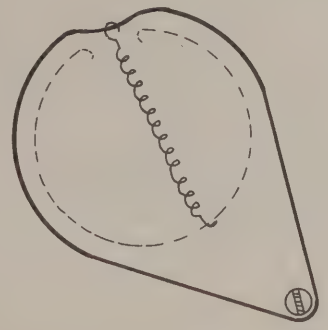
ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			EMERSON PART No.	JENSEN PART No.		
	FIELD	VC IMP.		ST-107		
46	PM	3.3Ω	180006	Mod. P5-W		
	CONE DIA.	VC DIA.				
47	4-3/4"	1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	EMERSON PART No.	MEISSNER PART No.	
48	Loop Ant.		1.5Ω	700090		
49	RF Coil	100Ω	4.5Ω	713000		
50	Osc. Coil	2.5Ω	7.5Ω	716030	14-1040†	†Add 50 MMFD cap. from grid to high side tuning cap.
51	Input IF	82Ω	83Ω	720170	16-6652	
52	Output IF	97Ω		720190	16-6654‡	‡Add to low side of secondary, 47KΩ resistor to high end vol. control, and 100 MMFD cap. to ground.

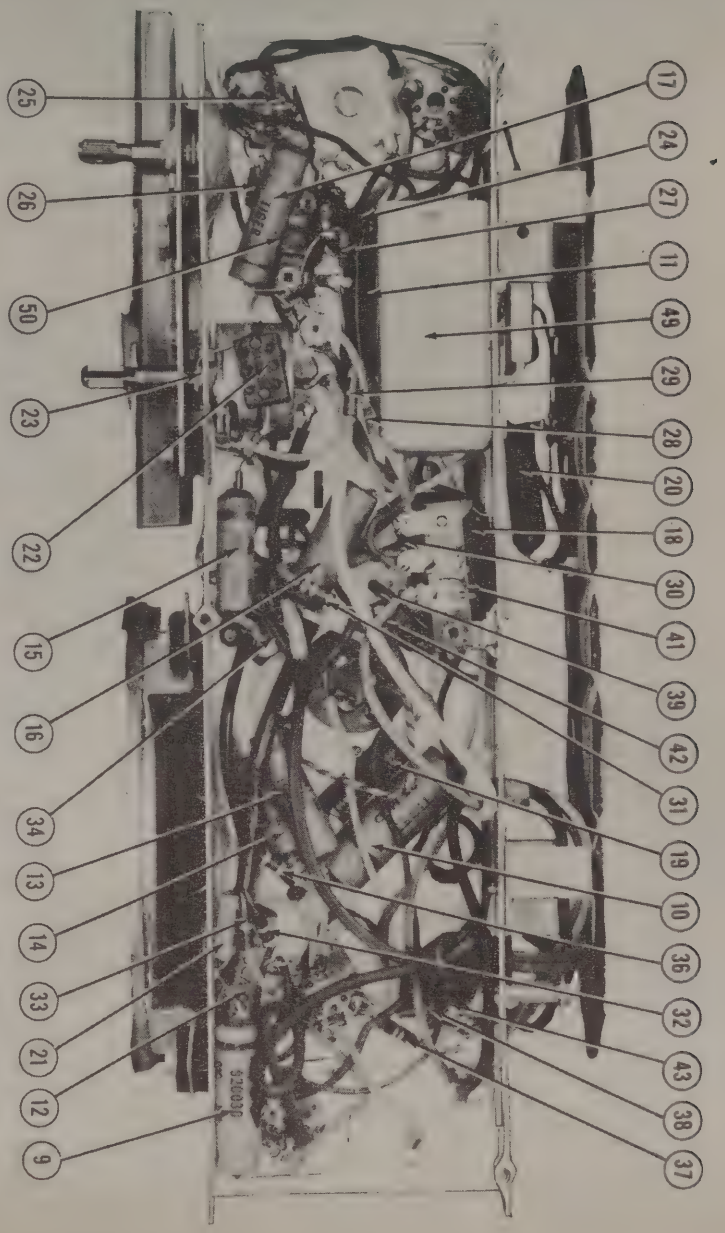
MISCELLANEOUS

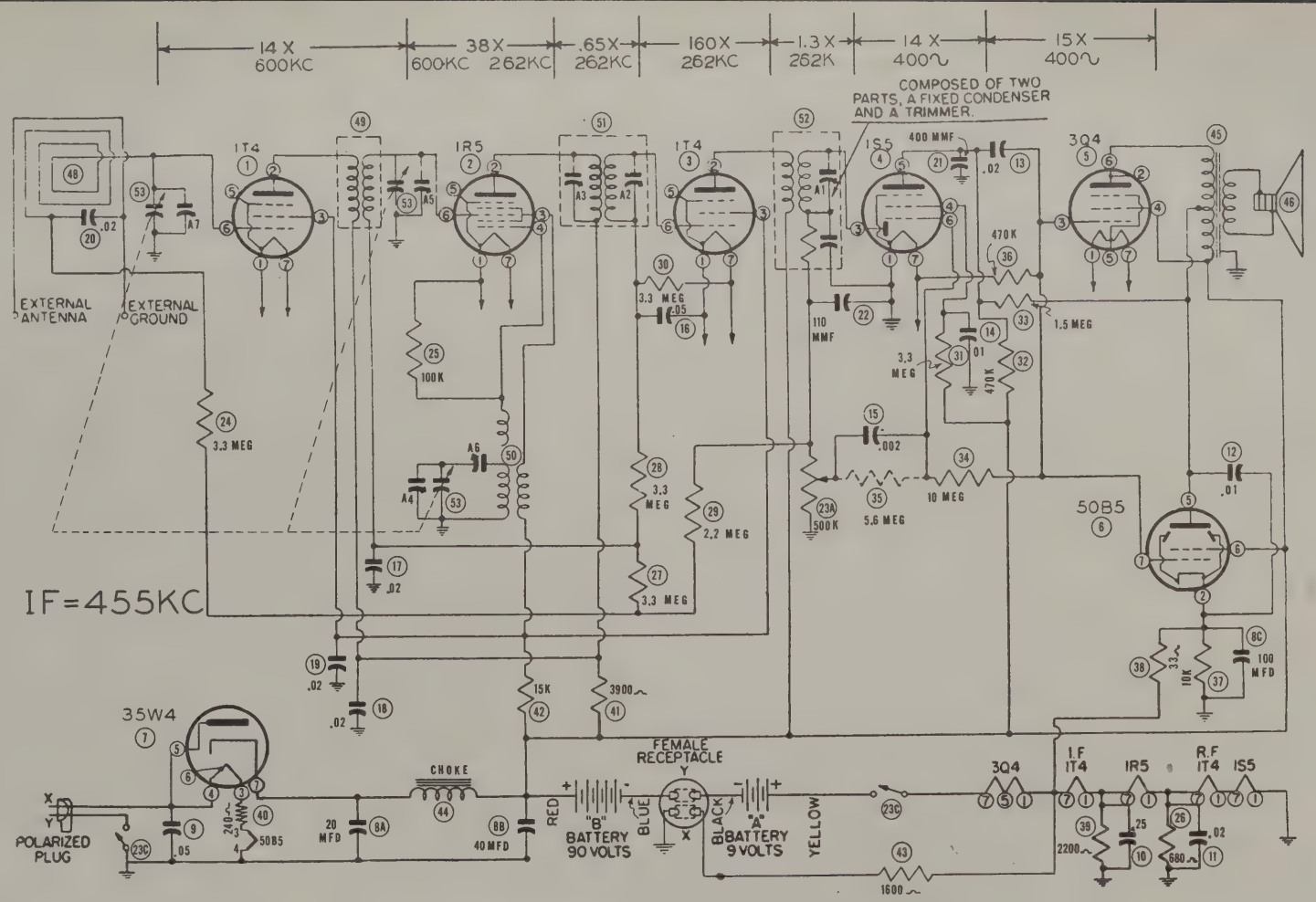
ITEM No.	PART NAME	EMERSON PART No.	NOTES
53	Tuning Cap.	900080	3 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





NOTE: MEASUREMENTS MADE IN AC-DC POSITION

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	1.27V.DC	85V. DC	50V. DC	0V	1.27V.DC	0V	2.45V.DC
2	1R5	2.45V.DC	85V. DC	50V. DC	1.6V. DC	2.45V.DC	.1V. DC	3.6V. DC
3	1T4	3.6V. DC	97V. DC	50V. DC	0V	3.6V. DC	.2V. DC	4.8V. DC
4	1S5	0V	0V	0V	17V. DC	50V. DC	0V	1.27V.DC
5	3Q4	4.8V. DC	90V. DC	.4V. DC	97V. DC	4.8V. DC	90V. DC	4.8V. DC
6	50B5	.4V. DC	6.5V.DC	32.2VAC	82V.AC	90V. DC	97V. DC	.4V. DC
7	35W4	0V	0V	82V.AC	117V.AC	117V.AC	108V.AC	125V.DC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
1	1T4	*	56KΩ	69KΩ	5 MEG	*	5 MEG	*
2	1R5	*	56KΩ	69KΩ	95KΩ	*	3 MEG	*
3	1T4	*	52KΩ	69KΩ	INF	*	2.5 MEG	*
4	1S5	*	INF	460KΩ	3.5 MEG	410KΩ	12 MEG	*
5	3Q4	*	52KΩ	410KΩ	52KΩ	*	52KΩ	*
6	50B5	410KΩ	80Ω	200Ω	250Ω	52KΩ	52KΩ	410KΩ
7	35W4	INF	INF	250Ω	280Ω	280Ω	270Ω	52KΩ

*DO NOT USE OHMMETER TO MEASURE FILAMENT RESISTANCE.

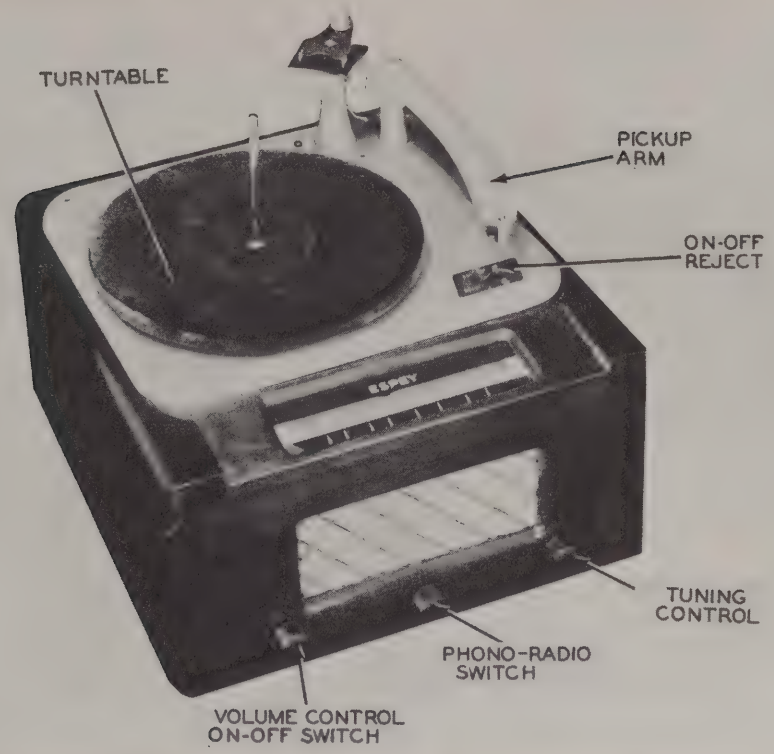
465-37

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.



ESPEY
MODEL 6545

ESPEY
MODEL 6545

ESPEY MODEL 6545

TRADE NAME	Espey Model 6545 (Ch. FJ-97)
MANUFACTURER	Espey Mfg. Co., Inc., 33 West 46th Street, New York, N.Y.
TYPE SET	AC Operated Combination Automatic Phono. - Superheterodyne Receiver - Self Contained Loop Antenna
TUBES (FIVE)	Types, 14Q7 Converter, 14A7 IF Amp., 14B6 Det.-AVC-AF, 50A5 Power Output, 35Y4 Rectifier.
POWER SUPPLY	105-125 Volts AC RATING - .240 Amps. @ 117V AC
TUNING RANGE—BROADCAST	540-1700KC **SHORT WAVE**

ALIGNMENT INSTRUCTIONS

Volume control at maximum volume and output from signal generator no higher than is necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.01 MFD	High side to ant. stator of tuning gang. Low side to B-.	455KC	Quiet point at high freq. end of dial.	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output. Use isolation transformer if available. If not, connect capacitor in series with low lead to B- and decrease dummy ant. to .001 MFD to prevent excessive hum modulation.
100 MMFD	High side to ant. lead. Low side to chassis.	1720KC	Rotor out of mesh. Full clockwise.	"	A5	Adjust for maximum output.
"	"	1500KC	Tune in 1500 KC signal.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA ESPEY PART No.	REPLACEMENT DATA STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	Converter	14Q7	14Q7	8AL	
2	IF Amp.	14A7	14A7	8V	
3	Det.-AVC-AF	14B6	14B6	8W	
4	Power Output	50A5	50A5	6AA	
5	Rectifier	35Y4	35Y4	5AL	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ESPEY PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
6A	30	150	A-25.019	2N513	M-2x30-150	TA-330	HRS150-40-40	BRD3315	Filter
B	30	150							"
7	.05	400		TP426	S-4-05	TC-15	484-.05	DT4S5	Line Filter
8	.02	400		TP423	S-4-02	TC-12	484-.02	DT4S2	50A5 Plate Bypass
9	.25	200		TP430	S-4-25	TC-2	484-.25	DT4P25	Line Isolating
10	.02	400		TP423	S-4-02	TC-12	484-.02	DT4S2	Audio Coupling
11	.005	600		TP408	S-6-005	TC-25	684-.005	DT6D5	" "
12	.005	600		TP408	S-6-005	TC-25	684-.005	DT6D5	AVC Filter
13	.002	200		TP405	S-6-002	TC-22	484-.002	DT6D2	Ant. Coupling
14	250	500		MC240	M0.5-325	1FM-325	1468-.00025	5W5T25	Audio Plate Bypass
15	250	500		MC240	M0.5-325	1FM-325	1468-.00025	5W5T25	RF Bypass Diode
16	250	500		MC240	M0.5-325	1FM-325	1468-.00025	5W5T25	Phono Coupling

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ESPEY PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
17A	500KΩ	1	A-9.066	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 17A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ESPEY PART No.	REPLACEMENT DATA IRC PART No.	IDENTIFICATION CODES
18	22KΩ	½		BTS-22K	Red-Red-Or. Osc. Grid
19	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue AVC Network
20	3.3 Meg.	½		BTS-3.3 Meg.	Or.-Or.-Grn. " "
21	15 Meg	½		BTS-15 Meg.	Br.-Grn.-Blue 1st AF Grid
22	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. 1st AF Plate Load
23	470KΩ	½		BTS-470K	Yl.-Vi.-Yl. Output Grid
24	150Ω	½		BW-½-150	Br.-Grn.-Br. Output Cathode
25	220KΩ	½		BTS-220K	Red-Red-Yl. Line Isolating
26	470Ω	1		BTA-470	Yl.-Vi.-Br. Filter - See Note 1
27	470Ω	1		BTA-470	Yl.-Vi.-Br. " - " " "
28	2.2 Meg.	½		BTS-2.2 Meg.	Red-Red-Grn. Series Phono.

Note 1 - Some models use a single 1000Ω filter resistor in place of Item 26 & 27.

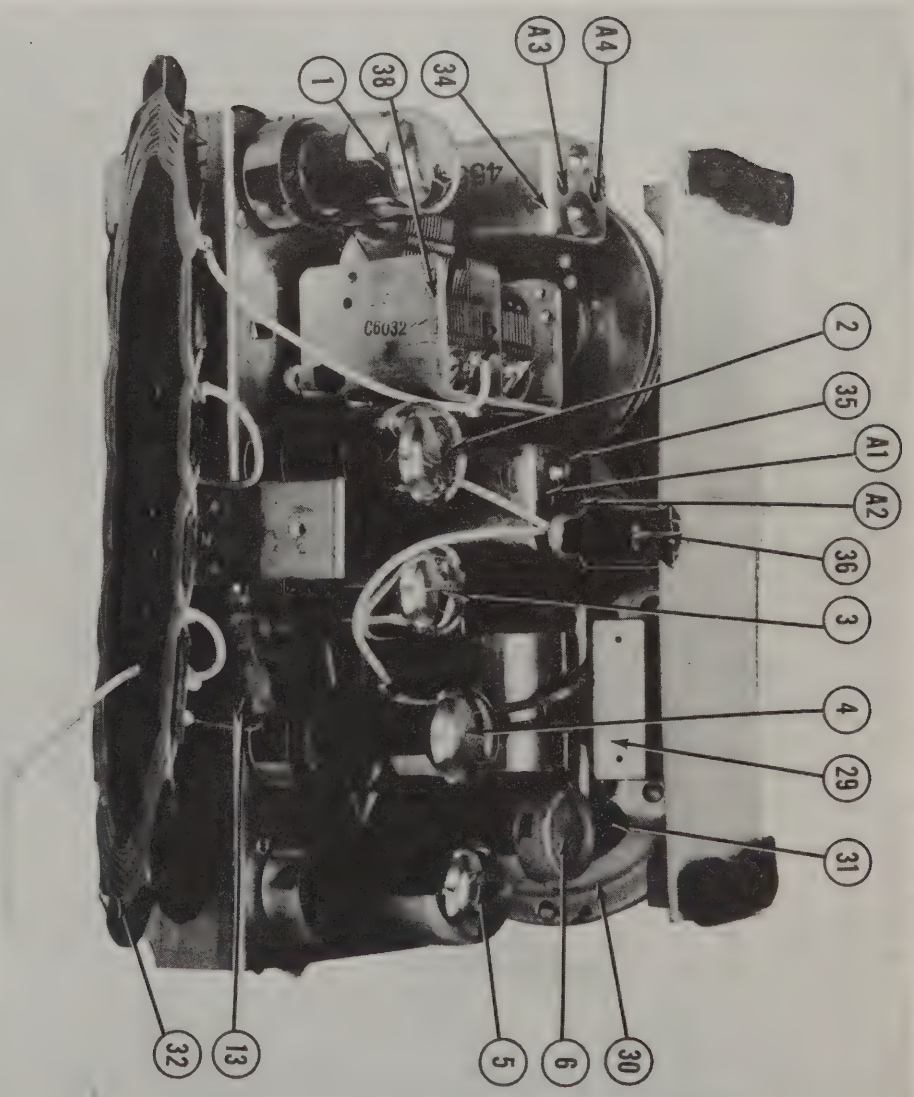
TRANSFORMER (OUTPUT)

ITEM No.	RATING IMPEDANCE PRI.	RATING IMPEDANCE SEC.	RATING DC RES. PRI.	RATING DC RES. SEC.	REPLACEMENT DATA ESPEY PART No.	REPLACEMENT DATA STANCOR PART No.	REPLACEMENT DATA THORDAR'N PART No.	INSTALLATION NOTES
29	17000Ω	3.3Ω	155Ω	.5Ω	Part of B-11.037	A-3876	T-14S82	

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA ESPEY PART No.	REPLACEMENT DATA JENSEN PART No.		INSTALLATION NOTES
	FIELD	VC IMP.				
30	PM	3.3Ω	B-11.037	ST-105		
	CONE DIA.	VC DIA.				
31	4-5/8"	9/16"				

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

R F COILS

ITEM No.	USE	DC RES. PRI.	DC RES. SEC.	REPLACEMENT DATA ESPEY PART No.	REPLACEMENT DATA MEISSNER PART No.	INSTALLATION NOTES
32	Loop Ant.	0Ω	1.3Ω			
33	Osc. Coil	.8Ω	6.2Ω		14-1040	Add 50 MFD cap. from grid to high side tuning cap.
34	Input IF	21.5Ω	21Ω		16-6666	
35	Output IF	14.2Ω	14.5Ω		16-6667	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA ESPEY PART No.		INSTALLATION NOTES
36	Bayonet	6-8	0.15	Brown			Type 47

MISCELLANEOUS

ITEM No.	PART NAME	ESPEY PART No.	NOTES
37	Switch		Radio-Phono
38	Tuning Cap.	C6.032	2 Gang Variable Cap.

DISASSEMBLY INSTRUCTIONS

1 - Remove the following push-on type knobs and felt washers: Volume Control, phono-radio, and tuning.

2 - Remove four Phillips head screws from chassis board. Remove chassis board from cabinet.

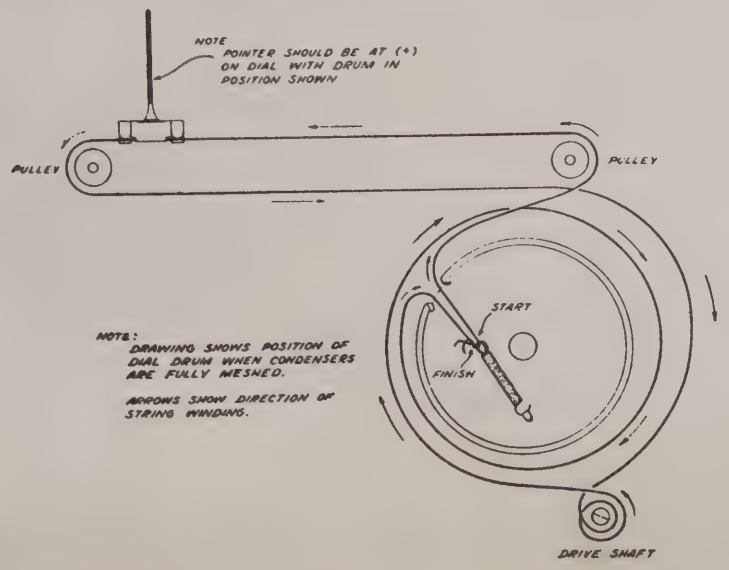
3 - Unsolder shielded pickup lead from ground on shielded lead going to chassis.

4 - Unsolder black lead going to yellow on terminal strip.

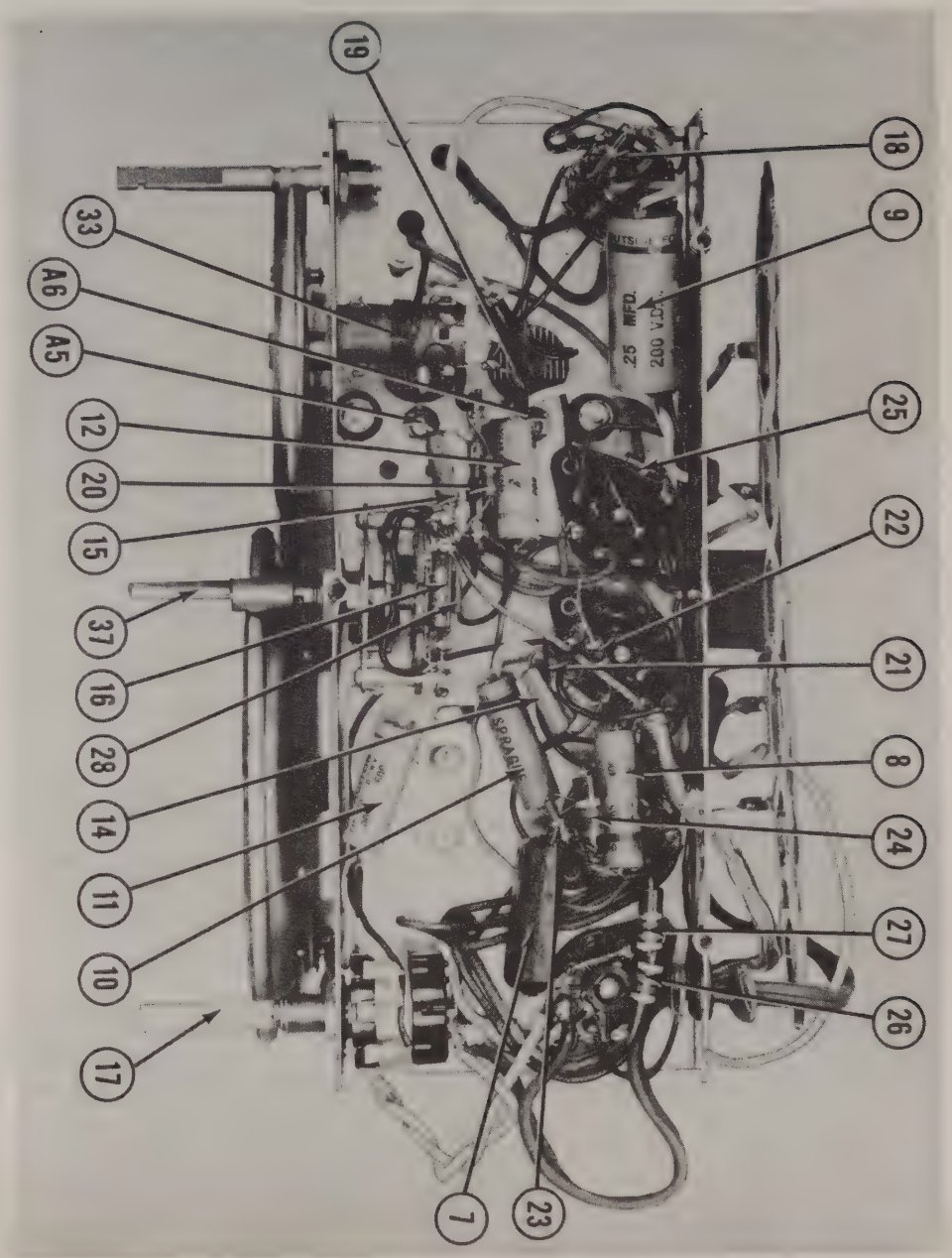
5 - Unsolder red lead going to black lead on terminal strip.

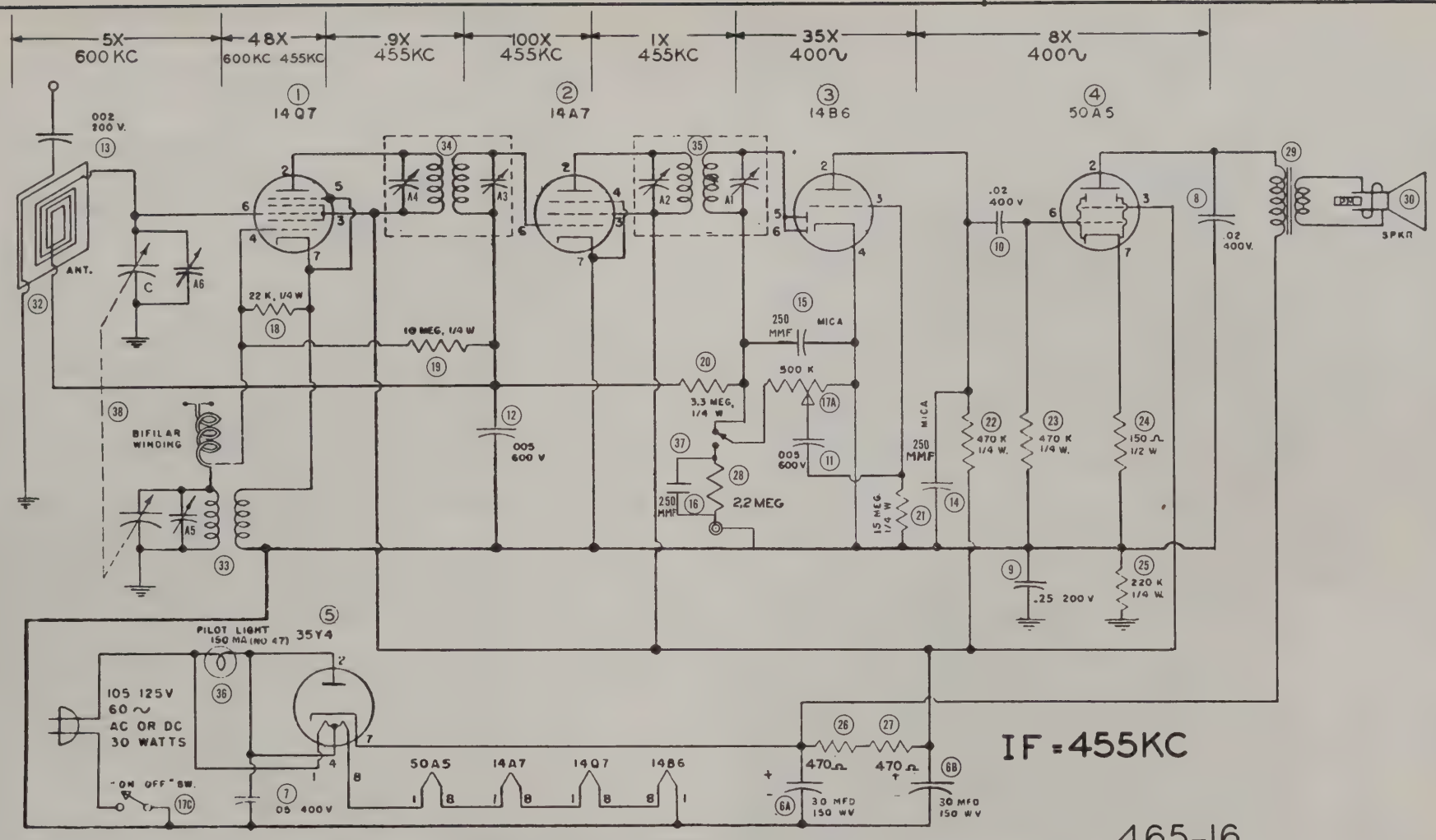
6 - Unsolder the two spliced phono-motor leads.

7 - Remove three hex screws and washers from chassis board. Remove chassis.



CHASSIS—BOTTOM VIEW





465-16

NOTE: VOLT & RES TAKEN IN BROADCAST POSITION.

VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14Q7	25.5V.AC	93V. DC	93V. DC	-4.8V.DC	0V.	-.15V. DC	0V.	13V.AC
2	14A7	38V.AC	93V. DC	93V. DC	0V.	0V.	-.15V. DC	0V.	25.5V.AC
3	14B6	0V.	60V. DC	-.45V.DC	0V.	-.7 V.DC	-.7V.DC	0V.	13V.AC
4	50A5	87V.AC	107V.DC	93V.DC	0V.	0V.	0V.	5.8V.DC	38V.AC
5	35Y4	117V.AC	113V.AC	0V.	113V.AC	103V.DC	0V.	113V.DC	87V.AC

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	14Q7	24.5 Ω	231 KΩ	231KΩ	19.8KΩ	.5Ω	2.7MEG	.5Ω	12.5 Ω
2	14A7	39 Ω	231 KΩ	231 KΩ	0Ω	222KΩ	2.7MEG	0Ω	24.5 Ω
3	14B6	0Ω	700KΩ	12 MEG	0Ω	470KΩ	470KΩ	1 NF	12.5 Ω
4	50A5	87Ω	230KΩ	231 KΩ	0Ω	0Ω	450KΩ	130 Ω	39 Ω
5	35Y4	112 Ω	110 Ω	1 NF	110 Ω	230 K	1 NF	230KΩ	87 Ω

Resistance readings in the B+ circuits may vary widely according to the condition of the filter capacitors.

The cooperation of the manufacturer of this receiver makes it possible to bring you this service.

The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. **DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.**
2. **Socket connections are shown as bottom views.**
3. **Measured values are from socket pin to common negative.**
4. **Line voltage maintained at 117 volts for voltage readings.**
5. **Nominal tolerance on component values makes possible a variation of + 10% in voltage and resistance readings.**
6. **Volume control at maximum, no signal applied for voltage measurements.**

TEMPLE
MODEL F616

TEMPLE
MODEL F616

TEMPLE MODEL F616

TRADE NAME	Temple Model F616
MANUFACTURER	Templetone Radio Mfg. Corp., New London, Conn.
TYPE SET	AC-DC Superheterodyne - Self Contained Loop Antenna
TUBES (SIX)	Types. 12SK7GT RF Amp., 12SA7GT Converter, 12SK7GT IF Amp., 12SQ7GT Det.-AVC-AF, 35L6GT Power Output, 35Z5GT Rectifier.
POWER SUPPLY	117 Volts AC-DC RATING .250 Amps. @ 117V AC
TUNING RANGE—BROADCAST	535-1600KC

ALIGNMENT INSTRUCTIONS

Use isolation transformer if available. If not, connect capacitor in series with low side of signal generator to B-. Volume control at maximum volume position and output from signal generator no higher than necessary to obtain output reading. Use insulated alignment screwdriver for adjusting.

DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
.1 MFD	High side to stator of rear section of variable. Low side to B-.	455KC	High freq. end of dial. (Variable fully open)	Across voice coil	A1,A2, A3,A4.	Adjust for maximum output.
200 MMF	High side to ext. ant. lead. Low side to chassis.	1600KC	"	"	A5	" " " "
"	"	1400KC	Tune for maximum output.	"	A6	" " " "

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PARTS LIST AND DESCRIPTIONS

TUBES

ITEM No.	USE	REPLACEMENT DATA: TEMPLE PART No.	REPLACEMENT DATA: STANDARD REPLACEMENT	RMA BASE TYPE	INSTALLATION NOTES
1	RF Amp.		12SK7GT	8N	
2	Converter		12SA7GT	8AD	
3	IF Amp.		12SK7GT	8N	
4	Det.-AVC-AF		12SQ7GT	8Q	
5	Power Output		35L6GT	7AC	
6	Rectifier		35Z5GT	6AD	

CAPACITORS

Capacity values given in the rating column are in mfd. for Electrolytic and Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING: CAP.	RATING: VOLT	REPLACEMENT DATA: TEMPLE PART No.	MALLORY PART No.	SOLAR PART No.	SPRAGUE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	IDENTIFICATION CODES AND INSTALLATION NOTES
7A	80	150		2N521	M-80+40-150	EL452*†	PRSA150-40-40 PRS150-40	EZ44315C*	Filter - Red
B	40	150							" - Blue
8	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	Line Filter
9	.01	400		TF421	S-4-01	TC-11	484-01	DT4S1	35L6 Plate Bypass
10	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	Audio Coupling
11	.005	400		TP408	S-6-005	TC-25	484-005	DT6D5	" "
12	.1	400		TP428	S-4-1	TC-1	484-.1	DT4P1	RF Bypass Pwr. Supp.
13	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	IF Screen Bypass
14	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	AVC Filter
15	.05	400		TP426	S-4-05	TC-15	484-05	DT4S5	" "
16	.25	400		TP430	S-4-25	TC-2	484-.25	DT4P25	Line Isolating
17	220	500		MC237	M0.5-32	1FM-32	1468-0002	5W5T2	35L6 Grid Bypass
18	10	500		MC215	M0.5-41	1FM-41	1468-00001	5W5Q1	Fixed Trimmer
19	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	Osc. Grid Capacitor
20	100	500		MC235	M0.5-31	1FM-31	1468-0001	5W5T1	RF Coupling

*Parallel two sections to obtain 80 MFD. Do not use bypass section
†Use insulating tube

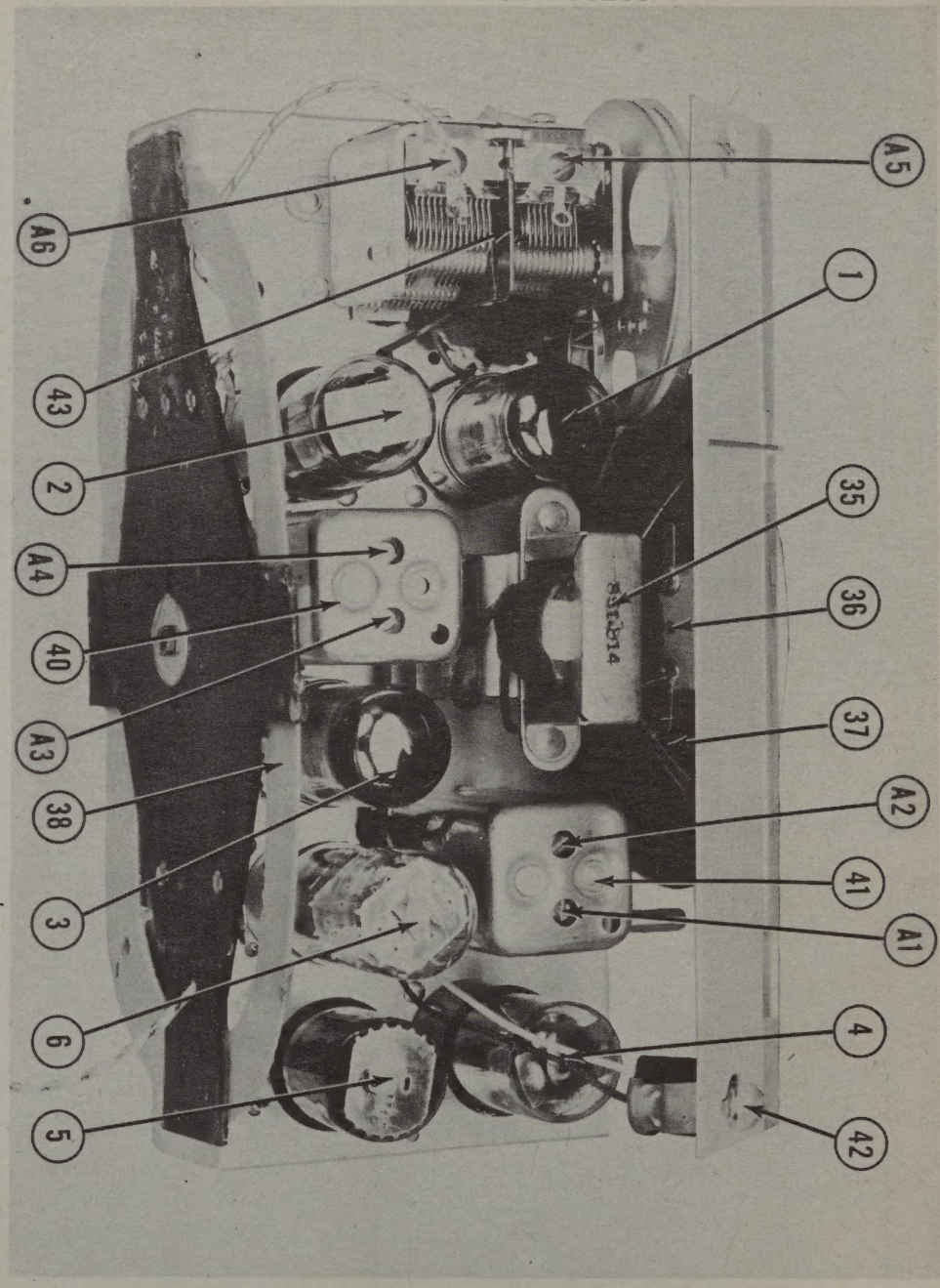
CONTROLS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TEMPLE PART No.	MALLORY PART No.	IRC PART No.	CLAROSTAT PART No.	INSTALLATION NOTES
21A	500K	1	650.504E	MR48	D13-133	M-60-Z	Volume Control
B	Shaft		Not Req.	Not Req.	A	Not Req.	Attach to 21A per instructions
C	Switch		" "	M26	41	SW-A	" " " " "

RESISTORS

ITEM No.	RATING: RESISTANCE	RATING: WATTS	REPLACEMENT DATA: TEMPLE PART No.	IRC PART No.	IDENTIFICATION CODES
22	10KΩ	½		BTS-10K	Br.-Blk.-Or. Osc. Grid
23	10KΩ	½		BTS-10K	Br.-Blk.-Or. Osc. Grid
24	3300Ω	½		BTS-3300	Or.-Or.-Red RF Plate Load
25	5600Ω	½		BTS-5600	Grn.-Blue-Red Converter Grid
26	220KΩ	½		BTS-220K	Red-Red-Yl. Line Isolating
27	2.2 Meg.	½		BTS-2.2 Meg	Red-Red-Grn. AVC Network
28	1000Ω	½		BTS-1000	Br.-Blk.-Red IF Screen Dropping
29	10 Meg.	½		BTS-10 Meg.	Br.-Blk.-Blue 1st AF Grid
30	220KΩ	½		BTS-220K	Red-Red-Yl. 1st AF Plate Load
31	270KΩ	½		BTS-270K	Red-Vi.-Yl. Output Grid
32	47Ω	½		BW-½-47	Yl.-Vi.-Blk. Output Cathode
33	1000Ω	2		BT-2-1000	Br.-Blk.-Red Filter
34	33Ω	1		BW-1-33	Or.-Or.-Blk. Surge Limiter

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (OUTPUT)

ITEM No.	RATING				REPLACEMENT DATA				INSTALLATION NOTES
	IMPEDANCE		DC RES.		TEMPLE PART No.	STANCOR PART No.	THORDAR'N PART No.		
	PRI.	SEC.	PRI.	SEC.					
35	2000Ω	3.35Ω	280Ω	.54Ω		A-3676	T-22845		

SPEAKER

ITEM No.	RATINGS		REPLACEMENT DATA			INSTALLATION NOTES
			TEMPLE PART No.	JENSEN PART No.		
36	FIELD PM	VC IMP. 3.35Ω		ST-106 Mod. P5-W		
37	CONE DIA. 4-3/4"	VC DIA. 1/2"	NOT READILY REPLACEABLE-USE COMPLETE SPEAKER UNIT.			

R F COILS

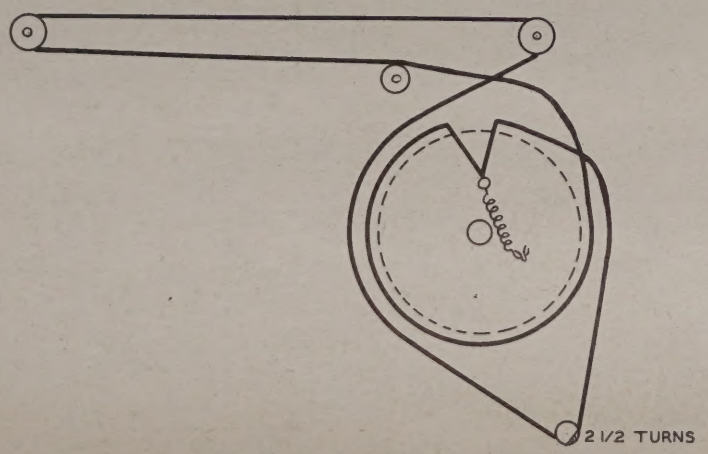
ITEM No.	USE	DC RES.		REPLACEMENT DATA		INSTALLATION NOTES
		PRI.	SEC.	TEMPLE PART No.	MEISSNER PART No.	
38	Loop Ant.	.1Ω	2Ω			
39	Osc. Coil		7Ω		14-1040	
40	Input IF	15.5Ω	15.5Ω		16-6658	
41	Output IF	14.5Ω			16-6670	

DIAL LIGHT

ITEM No.	BASE TYPE	VOLTS	AMPS.	BEAD COLOR	REPLACEMENT DATA		INSTALLATION NOTES
					TEMPLE PART No.		
42	Bayonet	6-8	0.2	White			Type 51

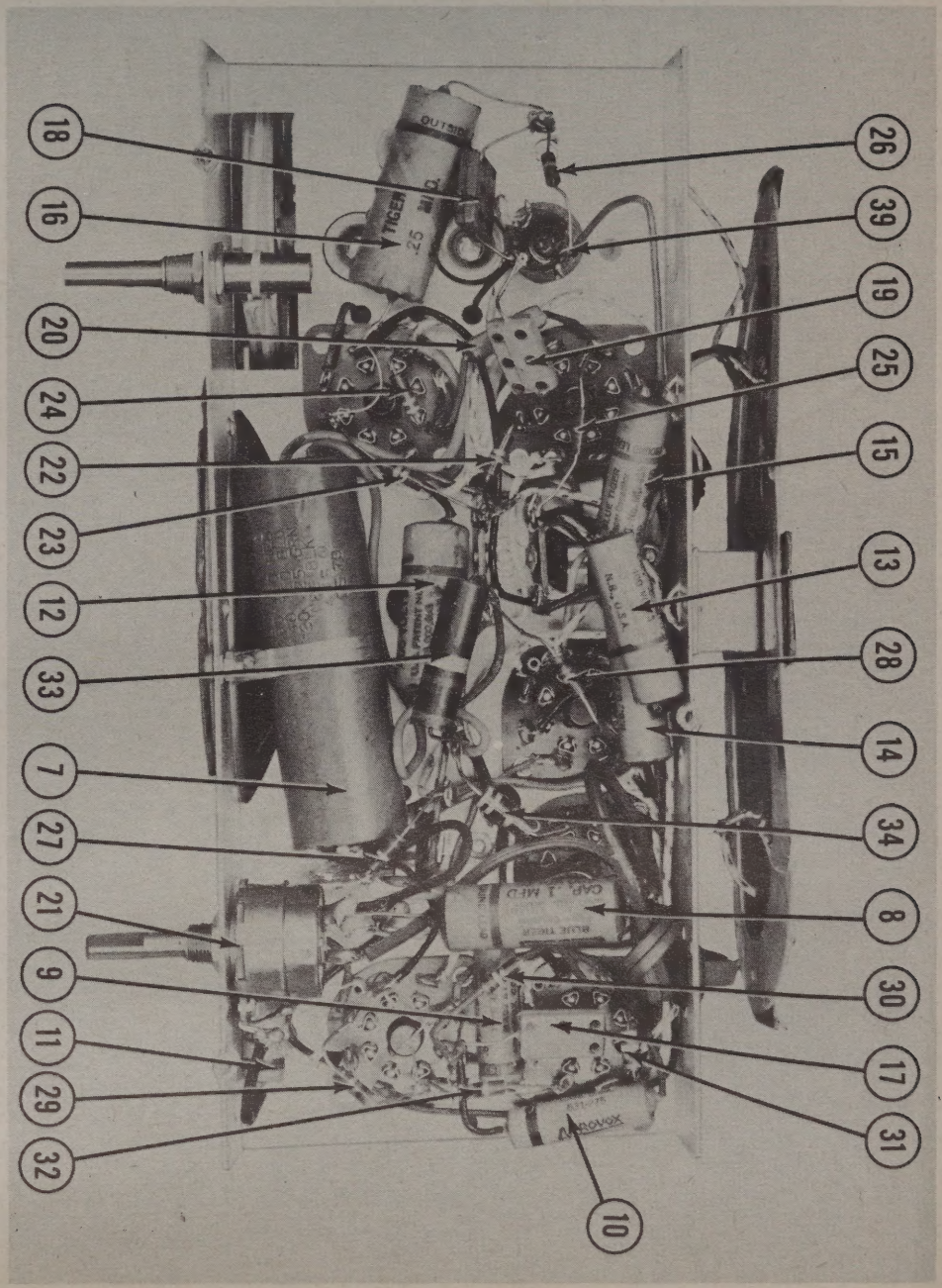
MISCELLANEOUS

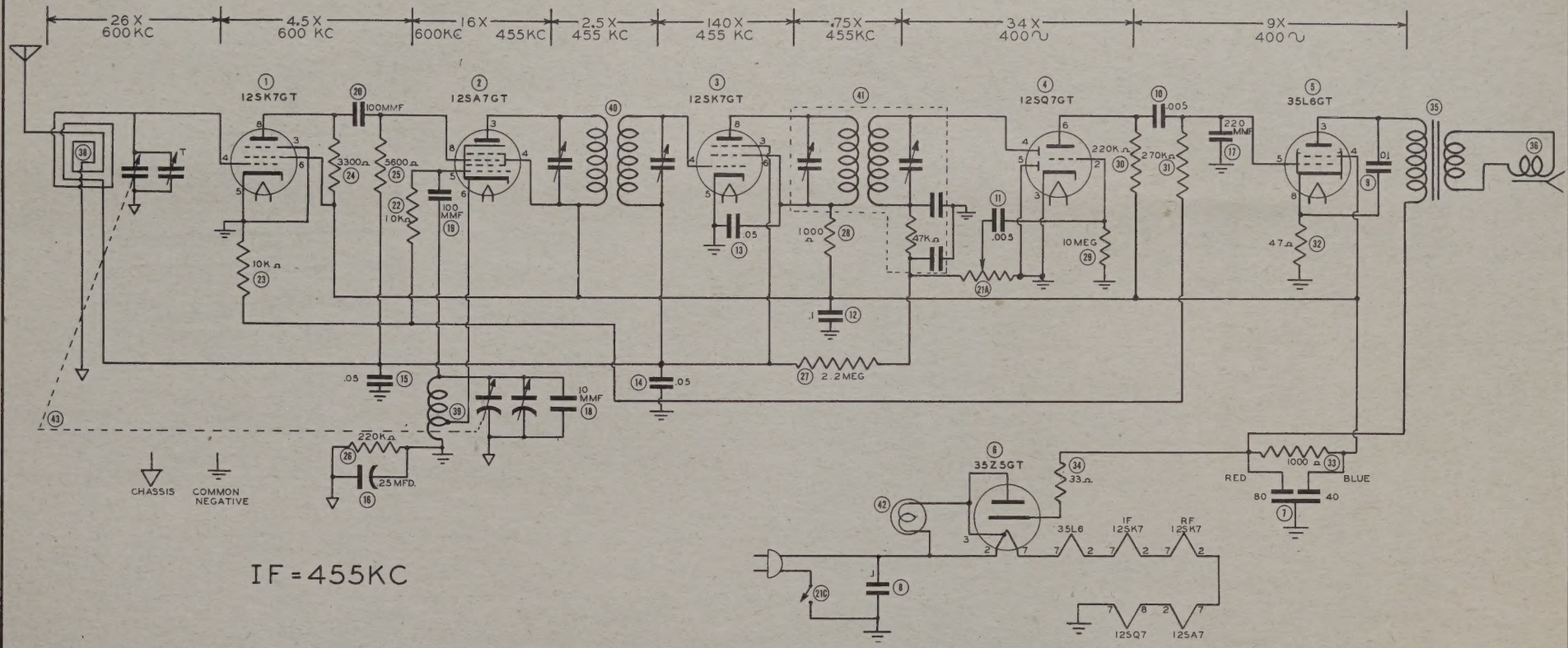
ITEM No.	PART NAME	TEMPLE PART No.	NOTES
43	Tuning Cap.		2 Gang Variable Cap.



DIAL CORD DRIVE

CHASSIS—BOTTOM VIEW





VOLTAGE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	0V	23.8VAC	0V	-.5V. DC	0V	77V.DC	36V.AC	50V.DC
2	12SA7GT	0V	12 V.AC	77V.DC	77V.DC	-5V.DC	0V	23.8V.AC	-.45V.DC
3	12SK7GT	0V	36V.AC	-.5V.DC	-.5V.DC	0V	68V.DC	48V.AC	68V.DC
4	12SQ7GT	0V	-.5V.DC	0V	-.25V.DC	0V	55V.DC	0V	12V.AC
5	35L6GT	0V	48V.AC	105V. DC	77V. DC	-.35V.DC	-2.2V.DC	86V.AC	1.6V.DC
6	35Z5GT	0V	117V.AC	113V.AC	0V	113V.AC	0V	86V.AC	116V.DC

THE COOPERATION OF THE MANUFACTURER OF THIS RECEIVER MAKES IT POSSIBLE TO BRING YOU THIS SERVICE

RESISTANCE READINGS

Item	Tube	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
1	12SK7GT	240KΩ	25.5 Ω	0Ω	2.9MEG	0Ω	90KΩ	39Ω	94KΩ
2	12SA7GT	240KΩ	13Ω	90KΩ	90KΩ	22KΩ	.75Ω	25.5Ω	3 MEG
3	12SK7GT	240KΩ	38Ω	2.9MEG	2.9MEG	0Ω	92KΩ	50Ω	92KΩ
4	12SQ7GT	240KΩ	9 MEG	0Ω	540KΩ	0Ω	310KΩ	0Ω	13Ω
5	35L6GT	INF	50Ω	90KΩ	90KΩ	370KΩ	10.5KΩ	84Ω	52Ω
6	35Z5GT	INF	111Ω	109Ω	INF	109Ω	INF	84Ω	90KΩ

RESISTANCE READINGS IN THE B+ CIRCUITS MAY VARY WIDELY ACCORDING TO THE CONDITION OF THE FILTER CAPACITATORS

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The stage gain measured values listed above are approximate values for an average operative stage, rather than an absolute value. It should be borne in mind that it is possible to introduce so many variables into the measurement operation, such as, type of equipment used for measuring, handling and placement of probes, the accuracy of alignment, etc., that an absolute reading is impractical. AVC is made inoperative and 3-volt battery bias substituted for measurement.

1. DC Voltage measurements are at 20,000 ohms per volt; AC Voltages measured at 1,000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ± 10% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.